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Vol. 1051 Number 3

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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

February 19, 1985

U.S.
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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

February 19, 1985 Volume 1051 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	64.00
Designation fee for 11th and subsequent designations	no charge

Dec. 24, 1984.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Feb. 16, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,315,334 through 4,316,285

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,376,551, Re. S.N. 674,220, Filed Nov. 23, 1984, Cl. 297/250, CHILD CARE SEAT AND RESTRAINING SYSTEM, Richard E. Cone, Owner of Record: *Spalding & Evenflo Cos., Inc., Tampa, Fla.,* Attorney or Agent: Donald R. Bahr, et al., Ex. Gp.: 357

4,381,335, Re. S.N. 674,160, Filed Nov. 23, 1984, Cl. 428/373, MULTI-COMPONENT COMPOSITE FILAMENT, Miyoshi Okamoto, Owner of Record: *Toray Industries, Inc., Tokyo, Japan,* Attorney or Agent: Austin R. Miller, et al., Ex. Gp.: 154

4,421,827, Re. S.N. 658,337, Filed Oct. 5, 1984, Cl. 428/418, COMPOSITES AND METHODS FOR PROVIDING METAL CLAD ARTICLES AND ARTICLES PRODUCED, Cecil L. Phillips, Owner of Record: *Scott Bader Co. Ltd., Northern, Ireland,* Attorney or Agent: J. Henry Seka, et al., Ex. Gp.: 164

4,459,933, Re. S.N. 675,598, Filed Nov. 28, 1984, Cl. 114/297, MARINE TETHER ANCHORING DEVICE, Clive J. Burchett, Owner of Record: *Vickers Ltd., London, England,* Attorney or Agent: Elliott I. Pollock, Ex. Gp.: 315

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Des. 265,517, Reexam. No. 90/000,712, Requested: Jan. 23, 1985, Cl. D34/17, STORAGE CART, Richard S. Dunchock, Owner of Record: *SL Container Corp.,* Attorney or Agent: Andrew R. Basile, Ex. Gp.: 291, Requester: SL Container Corp., Troy, Mich.

3,982,383, Reexam. No. 90/000,715, Requested: Jan. 25, 1985, Cl. 56/11.6, HARVESTING PLATFORM FLOATING CUTTER BAR, Roger E. Mott, Owner of Record: *Deere & Co., Moline, Ill.,* Attorney or Agent: H. Vincent Harsha, Ex. Gp.: 330, Requester: International Harvester Co., Chicago, Ill.

4,352,740, Reexam. No. 90/000,711, Requested: Jan. 16, 1985, Cl. 210/760, WATER OZONATION METHOD, Ronald J. Grader, et al., Owner of Record: *Linde Aktiengesellschaft, Wiesbaden, Germany,* Attorney or Agent: Millen & White, Ex. Gp.: 130, Requester: Owner

4,389,393, Reexam. No. 90,000,713, Requested: Jan. 23, 1985, Cl. 424/96, SUBTAINED RELEASE THERAPEUTIC COMPOSITIONS BASED ON HIGH MOLECULAR WEIGHT HYDROXYPROPYLMETHYCELLULOSE, Joseph M. Schor, et al., Owner of Record: *Forest Laboratories, Inc., New York, N.Y.,* Attorney or Agent: Fish & Neave, Ex. Gp.: 120, Requester: The Dow Chemical Co., Midland, Mich.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 19, 1985

D. 257,149	4,442,518	4,455,216	4,466,826
4,075,452	4,442,547	4,455,309	4,467,004
4,278,307	4,442,696	4,455,436	4,467,102
4,336,617	4,442,836	4,456,334	4,467,727
4,339,738	4,442,842	4,456,781	4,467,798
4,362,512	4,442,879	4,457,194	4,467,923
4,364,325	4,443,029	4,457,470	4,468,174
4,383,157	4,443,140	4,457,657	4,468,453
4,383,719	4,443,502	4,457,670	4,468,547
4,385,458	4,443,941	4,457,769	4,468,582
4,396,829	4,444,034	4,457,827	4,469,005
4,398,720	4,444,694	4,457,928	4,469,278
4,399,209	4,444,776	4,457,985	4,469,479
4,401,963	4,445,104	4,458,186	4,469,542
4,404,672	4,445,260	4,458,244	4,469,831
4,407,287	4,447,979	4,458,318	4,469,909
4,407,307	4,448,793	4,458,353	4,469,944
4,411,862	4,448,810	4,459,211	4,470,239
4,413,641	4,448,933	4,459,661	4,470,275
4,414,338	4,449,030	4,459,857	4,470,471
4,415,925	4,449,052	4,460,292	4,470,597
4,417,017	4,449,099	4,460,839	4,470,778
4,417,276	4,449,416	4,461,029	4,471,012
4,418,527	4,449,437	4,461,277	4,471,081
4,423,272	4,449,638	4,461,504	4,471,131
4,427,490	4,449,646	4,461,518	4,471,154
4,428,753	4,449,896	4,461,581	4,471,240
4,428,880	4,450,115	4,461,633	4,471,397
4,428,952	4,451,319	4,461,925	4,471,467
4,429,761	4,451,382	4,462,039	4,471,848
4,430,235	4,451,391	4,462,205	4,471,873
4,430,281	4,452,026	4,462,828	4,472,019
4,431,404	4,452,034	4,462,869	4,472,303
4,433,730	4,452,472	4,463,346	4,472,544
4,433,994	4,452,616	4,463,410	4,472,588
4,434,502	4,452,766	4,463,691	4,472,613
4,434,536	4,452,883	4,464,035	4,472,647
4,435,655	4,453,033	4,464,329	4,472,972
4,437,377	4,453,120	4,464,332	4,473,363
4,437,433	4,453,463	4,465,453	4,473,396
4,438,225	4,454,298	4,465,608	4,473,732
4,439,563	4,454,370	4,466,213	4,474,477
4,440,266	4,454,474	4,466,345	4,475,030
4,440,846	4,455,168	4,466,611	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF January 5, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-20-81
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	6-06-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-21-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	3-28-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-12-80
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	3-21-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	10-01-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-07-82
DESIGN, GROUP 290—K. L. CAGE, Director	9-09-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	3-04-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-13-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	12-01-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	12-21-81
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	12-04-81

Expiration of patents: The patents within the range of numbers indicated below expire during January 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,360,800 to 3,366,969, inclusive

Plant Patents ..... Numbers 2,784 to 2,793 inclusive

REEXAMINATIONS

FEBRUARY 19, 1985

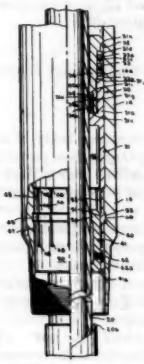
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,920,075 (302nd)

METHOD FOR POSITIONING A LINER ON A TUBULAR MEMBER IN A WELL BORE WITH A RETRIEVABLE PACK OFF BUSHING THEREBETWEEN

Britt O. Braddick, Houston, and Hiram E. Lindsey, Midland, both of Tex., assignors to Texas Iron Works, Inc., Houston, Tex.

Reexamination Request No. 90/000,520, Mar. 2, 1984.
Reexamination Certificate for Patent No. 3,920,075, issued Nov. 18, 1975, Ser. No. 440,714, Feb. 8, 1974.
Int. Cl.³ E21B *33/13*
U.S. Cl. 166—290



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6** are determined to be patentable as amended.

1. A method of positioning a liner on a well string *for bonding* in a well bore comprising the steps of:

a. securing the liner on the well string;

b. *releasably* locking a seal bushing *to the liner* in position between the liner and the well string to seal off therebetween **[**;**]** *to accommodate axial movement of the well string relative to the seal bushing while avoiding communication between the inside and outside of the liner throughout the length of the liner below the seal bushing and above where bonding agent is discharged from the liner into the well bore;*

c. lowering the well string and liner to a desired position in the well bore;

d. rotating the well string relative to the liner to disengage the liner from the well string;

e. **[**discharing**]** *discharging* a bonding agent from the well string and into the well bore around the liner; **[**and**]**

f. thereafter moving the well string longitudinally of the liner *and the seal bushing* to unlock the seal bushing **[**.**]** *;* and

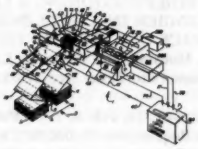
g. retrieving the well string and seal bushing from the well bore.

B1 4,194,685 (303rd)

VERIFYING INSERTION SYSTEM APPARATUS AND METHOD OF OPERATION

James E. Hill, Prospect Heights; Baesley I. Dahlstrom, Des Plaines, and Robert D. Fisher, Melrose Park, all of Ill., assignors to Dynetics Engineering Corp., Wheeling, Ill.

Continuation-in-part of Ser. No. 768,446, Feb. 14, 1977, abandoned, which is a division of Ser. No. 615,112, Sep. 19, 1975, Pat. No. 4,034,210.
Reexamination Request No. 90/000,268, Oct. 13, 1982.
Reexamination Certificate for Patent No. 4,194,685, issued Mar. 25, 1980, Ser. No. 832,001, Sep. 9, 1977.
Claims priority, application Canada, Sep. 17, 1976, 261445; United Kingdom, Sep. 20, 1976, 38812/76
Int. Cl.³ G06F *15/20;* **B65B** *1/00;* **B41F** *13/56*
U.S. Cl. 235—375



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** and **43–58** is confirmed.

Claims **19**, **31**, and **38–40** are cancelled.

Claims **18**, **20–30**, **32–37**, **41** and **42** are determined to be patentable as amended.

New claims **59–61** are added and determined to be patentable.

1. Method of automatic verification and insertion of credit cards in carriers therefor comprising the steps of:

(a) providing carriers to a first station, said carriers having disposed thereon machine readable information relating to an individual cardholder account, said information being selected from information on the number of credit cards authorized for said account, and information uniquely identifying said cardholder or account,

(b) machine reading at least a portion of said information on said carriers in said first station,

(c) providing credit cards to a second station, said cards having thereon machine readable information relating to an individual cardholder or account,

(d) machine reading said information on said cards in said second station,

(e) sequentially comparing said card information with said carrier information until a condition of matched information is produced,

(f) inserting the correct number of properly matched cards into the appropriate carrier in response to said matched information condition.

18. Method of **[**automatic verification and**]** insertion of *correctly matching* credit cards *into releasable retentive engagement with the appropriate* carriers therefor *by an automated high-speed insertion machine* comprising the steps of:

(a) providing carriers *specially a*[a]*pted* to retain credit cards in **[**association**]** *releasable retentive engagement* therewith**[**,**]** *with information in the form of indicia which uniquely identifies the cardholder or account cards inserted therein;*

(b) providing *said* credit cards [having thereon machine readable] *with* information *in the form of machine readable indicia which* uniquely identif[ying] *ies* a cardholder or account[,]*;*

(c) comparing at least some of said uniquely identifying information provided said carrier with said uniquely identifying information provided said credit cards to determine whether said credit cards match said carriers, and

(d) [c] *machine* inserting the correct number of *said* credit cards *authorized for said cardholder or account* into *releasable retentive engagement with* each said carrier in accordance with *said match of said* information, *said steps in combination achieving automated high-speed machine insertion and verification of the appropriate number of correctly matched cards into releasable retentive engagement with their appropriate carriers.* [on the number of cards authorized for said cardholder or account,

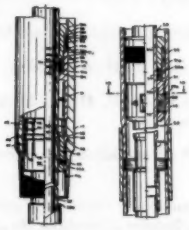
(d) identifying said carrier with information uniquely identifying the cardholder or account cards inserted therein.]

B1 4,281,711 (304th)

APPARATUS FOR POSITIONING A LINER ON A TUBULAR MEMBER IN A WELL BORE WITH A RETRIEVABLE PACK OFF BUSHING THEREBETWEEN

Britt O. Braddick, Houston, and Hiram E. Lindsey, Midland, both of Tex., assignors to Texas Iron Works, Inc., Houston, Tex.

Division of Ser. No. 440,714, Feb. 8, 1974, Pat. No. 3,920,075.
Reexamination Request No. 90/000,517, Mar. 2, 1984.
Reexamination Certificate for Patent No. 4,281,711, issued Aug. 4, 1981, Ser. No. 555,691, Mar. 5, 1975.
Int. Cl.[3] **E21B** *33/14*
U.S. Cl. 166—118



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **14**, **19**, **20** and **25** are determined to be patentable as amended.

Claims **2–13**, **15–18**, and **21–24**, dependent on an amended claim, are determined to be patentable.

1. A retrievable pack off bushing for sealing between a liner and tubular member in a well string during bonding operations in a well bore comprising:

(a) body means for fitting between the liner and tubular member;

(b) seal means on said body *means* for engaging the liner and tubular member for sealing therebetween [;]*, said seal means positioned to avoid communication between the inside and the outside of the liner throughout the length of the liner below said body means and above where bonding agent is discharged from the liner into the well bore;*

(c) cooperating surface means on the liner, tubular member and said body means [engagable] *engageable* with each other to lock said body means to the liner for sealing between the liner and tubular member while accommodating axial movement of the tubular member; and

(d) means to unlock said cooperating surface means from each other upon a predetermined amount of further relative longitudinal movement between the tubular member and said body means whereby said body means may be retrieved with the tubular member and well string from the well bore.

B1 4,342,811 (305th)

OPEN-CELLED MICROPOROUS SORBENT-LOADED TEXTILE FIBERS AND FILMS AND METHODS OF FABRICATING SAME

George Lopatin, Newton; Myron J. Coplan, Natick, and James P. Walton, Jr., Newton, all of Mass., assignors to Albany International Corp., Albany, N.Y.

Reexamination Request No. 90/000,538, Apr. 9, 1984.
Reexamination Certificate for Patent No. 4,342,811, issued Aug. 3, 1982, Ser. No. 108,178, Dec. 28, 1979.
Int. Cl.[3] **B01D** *39/04, 39/16;* **B29D** *27/00;* **C08J** *9/26*
U.S. Cl. 428—220

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

claim **20** is cancelled.

Claims **1**, **17** and **21** are determined to be patentable as amended.

Claims **2–16**, **18**, **19** and **22**, dependent on an amended claim, are determined to be patentable.

New claims **23–31** are added and determined to be patentable.

1. An open cell microporous body *of a polymeric material and 10-50 percent by weight of sorbent particles dispersed throughout said polymeric material in a state of high sorbent activity, said body being capable of cold drawing at least 2X and having been* produced by

mixing *said* sorbent particles [in a uniform liquefied blend comprising]*, said* polymeric material and a diluent material, [the blend being heated]

heating the mixture to a first temperature above the fusion temperature of *said* [the] polymeric material *to form a uniform molten blend,*

extruding *said molten blend* [the mixture] to form the body,

attenuating the body by draw-down from the melt,

cooling the body to a second temperature sufficiently below the first temperature to cause *said* [the] diluent material to undergo separation from *said* [the] polymeric material into *an interconnected* [a] fine distinct phase, and *then*

extracting the diluent material from said body to *leave mutually interconnected pores dispersed throughout the body of the polymer* [to create an open-cell polymeric matrix, the sorbent particles being dispersed throughout the maxtrix in a state of high sorbent activity and in an amount between 10 and 50 percent by weight of the body after said extraction].

17. A method of forming *an open-cell microporous body of a polymeric material and 10–50 percent by weight of sorbent particles dispersed throughout said polymeric material in a state of high sorbent activity* [a sorbent body] *, said method* including the steps of

mixing sorbent particles, a polymeric material and a diluent material and heating the mixture to a first temperature above the fusion temperature of the polymeric material, thereby forming a melt blend, the diluent material being chosen to be a liquid compatible and mixing uniformly with the polymeric material at said first temperature,

extruding the melt blend through an orifice to form *an extrudate* [said body],

attentuating the extrudate by draw-down from the melt,

cooling the *extrudate* [body] to a second temperature sufficiently below said first temperature to cause the diluent material to undergo separation from the polymeric material into *an interconnected* [a] fine distinct phase, and *then*

extracting the diluent material from said *extrudate* [body] to *leave mutually interconnected pores dispersed throughout the polymeric material* [create an]*, thereby creating said* open-cell [polymeric matrix] *microporous body* with said particles dispersed throughout [said matrix] in a highly active sorbent state.

REISSUES

FEBRUARY 19, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

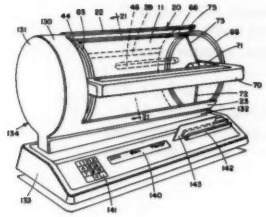
Re. 31,833
FOOD COOKING APPARATUS

Herbert H. Loeffler, Arlington, and Samuel W. Tishler, Bolton, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Original No. 4,304,177, dated Dec. 8, 1981, Ser. No. 124,091, Feb. 25, 1980. Application for reissue Oct. 21, 1983, Ser. No. 544,025

Int. Cl.³ A47J *27/00*

U.S. Cl. 99—332 **42 Claims**



38. In a cooker of the type having an open-mouthed, rotatable cooking vessel, drive means for rotating said vessel about its longitudinal axis, lid means for closing the open mouth of the vessel and containing an air vent, heating means adjacent and exterior to said vessel for applying heat to said vessel and its contents, and temperature sensing means for sensing the temperature of the gases in the vessel and generating a temperature signal indicative of said temperature, a control apparatus comprising:

(a) a microprocessor means having an internal clock for measuring elapsed time,

(b) power controller means responsive to said temperature sensing means and arranged to actuate and control said heating means,

(c) switch means responsive to said temperature sensing means to control said internal clock, and

(d) means to program said microprocessor means to perform through said power controller means a predetermined temperature/elapsed time cooking protocol, said means to program said microprocessor further comprising a magnetic stripe or bar code reader to read a magnetic stripe or bar code affixed to a card substrate, a hand or voice operable panel, or a combination of said reader and said panel.

Re. 31,834
ACCUMULATING LIFT AND CARRY CONVEYOR

Peter J. Manetta, 35632 Saxony, Sterling Heights, Mich. 48077

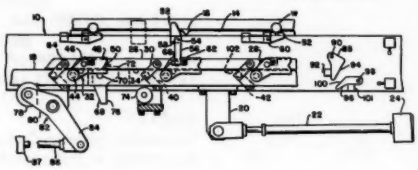
Original No. 3,552,543, dated Jan. 5, 1971, Ser. No. 763,819, Sep. 30, 1968. Application for reissue Feb. 25, 1980, Ser. No. 124,041

The portion of the term of this patent subsequent to Dec. 15, 1987, has been disclaimed.

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—751 **10 Claims**

14. A lift and carry conveyor comprising: an elongated stationary frame providing a series of equally spaced article supporting stations; a slide movable longitudinally of said frame between an initial return position and an advanced position; mechanical article sensing devices on said frame at each station; individually movable article carriers on said slide movable between idle and feed positions; actuating means including means bringing said carriers moved to feed position into contact with said articles and elevating articles from said supporting stations; said actuating means also including means moving said slide, carriers, and elevated articles forwardly to said advanced position to move articles supported on said carriers to the next succeeding stations, said actuating means further including means lowering said carriers to deposit said articles on the next succeeding stations, and said actuating means additionally including means moving said slide and carriers rearwardly to said initial position; one way positive acting mechanical means between each pair of adjacent carriers operable when any one carrier is shifted to feed position to move all carriers to the rear of said one carrier to feed position while not so



moving carriers forward of said one carrier; an element on each carrier engageable by movement of said slide from said initial position with the article sensing device at the empty station to which said carrier can deliver an article and operable to move said carrier to feed position; said one-way positive acting mechanical means acting to move to feed position all carriers to the rear of the said carrier but not to so move carriers forward of said carrier; means for moving said carriers to idle position during motion of said slide from said advanced position.

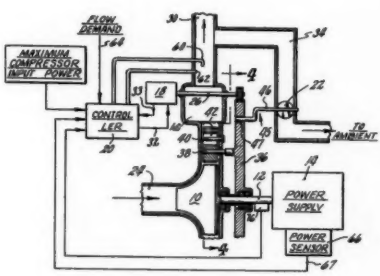
Re. 31,835
PNEUMATIC SUPPLY SYSTEM HAVING VARIABLE GEOMETRY COMPRESSOR

George C. Rannenberg, Canton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Original No. 4,405,290, dated Sep. 20, 1983, Ser. No. 210,071, Nov. 24, 1980. Application for reissue Dec. 19, 1983, Ser. No. 562,793

Int. Cl.³ F04B *27/02*

U.S. Cl. 417—282 **5 Claims**



1. A pneumatic supply system characterized by:
a compressor including a variable geometry stator portion

included in an outlet portion of said compressor, for providing delivery by said compressor of an airflow of varying magnitude in accordance with demands of a load;

actuator means for operating said variable geometry stator portion;

a dump valve disposed in fluid communication with said compressor outlet and sequentially operated with said variable geometry stator portion by said actuator means; and

control means responsive to the flow demand of said load, the flow output of said compressor, the power input and maximum allowable power input to said compressor and the position of said variable geometry stator portion for controlling said actuator means, thereby controlling the actuation of said variable geometry stator portion and said dump valve.

Re. 31,836

PHARMACEUTICAL AND DIETARY COMPOSITION

David F. Horrobin, Montreal, Canada, assignor to Efamol Limited, London, England

Original No. 4,388,324, dated Jan. 14, 1983, Ser. No. 159,402, May 15, 1980. Application for reissue Feb. 16, 1984, Ser. No. 581,671

Int. Cl.[3] **A01N** *37/02, 37/00;* **A61K** *37/00;* **A01N** *59/26, 59/20*

U.S. Cl. 514—474 **9 Claims**

1. A pharmaceutical composition *in capsule or tablet or suppository form* for treating alcoholism or moderating the effect of taking alcohol consisting essentially of γ-linolenic acid and/or dihomo-γ-linolenic acid, optionally in association with linoleic acid or other fat acids, said acids being present as such or as physiologically functional ester or other derivative thereof, in combination with ascorbic acid.

PLANT PATENTS

GRANTED FEBRUARY 19, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,406

APPLE TREE 'MERAN'

Karl Zanon, Via Sibilla 11, Merano, Italy (39012), and Franz Waldner, Via Roma 109, Merano, Italy

Filed Jul. 26, 1982, Ser. No. 402,133
Claims priority, application Italy, May 17, 1982, 1001NV/82
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple created by crossing of the varieties Golden Delicious and Morgenduft, as shown and described herein.

PATENTS

GRANTED FEB. 19, 1985

ERRATA

For CLASS	See PATENT NO.
361–056	4,499,673
043–042	4,499,682
172–068	4,499,747
101–152	4,499,831
126–247	4,499,913
384–467	4,450,143
384–463	4,450,144
350–574	4,450,181
404–006	4,450,225
425–511	4,450,284
433–215	4,450,294
433–225	4,450,296
084–001	4,450,317
534–635	4,450,455
514–002	4,450,467
514–002	4,450,518
514–056	4,450,519
514–063	4,450,520
514–081	4,450,521
514–173	4,450,522
514–178	4,450,523
514–250	4,450,524
514–210	4,450,525
514–226	4,450,526
514–223	4,450,527
514–228	4,450,528
514–235	4,450,529
514–255	4,450,530
514–255	4,450,531
514–256	4,450,532
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514–301	4,450,534
514–277	4,450,535
514–397	4,450,536
514–383	4,450,537
514–367	4,450,538
514–364	4,450,539
514–397	4,450,540
514–466	4,450,541
514–465	4,450,542
514–469	4,450,543
514–543	4,450,544
514–619	4,450,545
514–781	4,450,546
252–058	4,450,678
524–533	4,450,683
523–400	4,450,703
514–452	4,450,731

PATENTS

GRANTED FEBRUARY 19, 1985

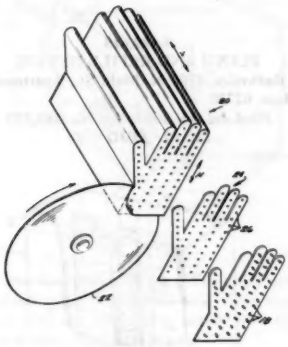
GENERAL AND MECHANICAL

4,499,611

PRODUCTION OF BREATHING MATERIALS

Murray A. Davis, 4874 Cote des Neiges Rd., Apt. 1001, Montreal, Quebec, Canada H3V 1H4

Filed Jan. 5, 1983, Ser. No. 455,824
Int. Cl.³ A41D *19/02*; B29D *7/18*
U.S. Cl. 2—169 **14 Claims**



1. A method of forming a porous flexible sheet material utilizing a mold elongated in a first dimension, comprising the steps of:

(a) disposing a plurality of strands of porous fibrous material in said mold extending substantially along said first dimension;

(b) substantially filling the mold with a liquid thermoplastic material to provide a slab having a thickness at least several times the thickness of the desired sheet to be formed therefrom;

(c) cooling the thermoplastic material to provide a slab having a plurality of strands of porous fibrous mterial extending therein; and

(d) slicing the slab in a dimension substantially perpendicular to said first dimension to provide flexible sheets having the desired thickness and having a plurality of spaced breathing apertures extending through the thickness thereof, the apertures filled with porous fibrous material.

4,499,612

POCKET FOR GARMENTS

Shunji Koike, 14-90 3-Ban 5 Chome, Ohmiya, Asahiku Osaka, Japan

Filed Apr. 7, 1983, Ser. No. 482,807
Int. Cl.³ A41D *27/20*
U.S. Cl. 2—250 **6 Claims**

1. A pocket construction for garments, comprising:

a. a first pocket and a second pocket,

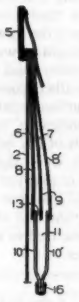
b. said first pocket being secured to said second pocket, and both pockets being secured to a garment,

c. the bottom of the second pocket extending a spaced distance below the bottom of the first pocket and forming a pouch portion for both pockets,

d. a relatively small opening formed in the bottom of the first pocket and providing a passage from the first pocket into said pouch portion,

e. said opening being of a size which would allow small articles such as coins to pass therethough, but would prevent larger articles from passing therethrough,

f. whereby small articles deposited in the first pocket pass through said opening and are collected in said pouch portion from which they are retrievable through the second pocket, and



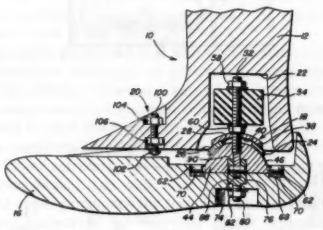
g. whereby larger articles deposited in the first pocket are prevented from passing through said opening and are collected in said first pocket from which they are retrievable.

4,499,613

ANKLE JOINT AND COUPLING FOR ARTIFICIAL LIMBS

Harry A. Yarrow, 135 S. Sparks St., Burbank, Calif. 91506

Filed Mar. 1, 1983, Ser. No. 471,274
Int. Cl.³ A61F *1/04*
U.S. Cl. 3—31 **9 Claims**



1. An ankle joint for connecting an artificial foot member to an artificial leg member comprising an inverted cup-shaped member attached to the lower end of the leg member and including a longitudinally extending arcuately curved, downwardly facing lower surface, said arcuately curved surface being transversely straight, and a correspondingly-shaped upwardly facing upper surface, a rocker member connected to the foot member and having an arcuate longitudinal surface facing upwardly, said upwardly facing arcuate surface being transversely straight and engaging the correspondingly-shaped downwardly facing surface on the inverted cup-shaped member and bolt means extending through the rocker member and inverted cup-shaped member for connecting said members together, at least one of said inverted cup-shaped member and rocker member having a longitudinally extending slot therein to enable relative pivotal movement between the rocker member and cup-shaped member and between the foot member and leg member about a transverse axis paralleling the transverse straight surfaces and disposed below the transverse straight surface, said leg member including a cavity communicating

with the lower end thereof, said bolt means extending upwardly in said cavity above said inverted cup-shaped member, a resilient member mounted on the upper end portion of the bolt means within the cavity for engaging the peripheral walls of the cavity to limit and cushion relative movement between the foot member and the leg member, said arcuate slot being formed in said inverted cup-shaped member, and an overlying cup-shaped member having a downwardly facing longitudinal arcuate surface which is transversely straight corresponding with and slidingly engaging the upwardly facing longitudinally arcuate, transversely straight upwardly facing surface on the inverted cup-shaped member, said inverted cup-shaped member having parallel sidewalls perpendicular with respect to the longitudinally arcuate surface, said rocker member including parallel sidewalls perpendicular to the arcuate longitudinal surface with the sidewalls of the inverted cup-shaped member telescoping downwardly over the sidewalls of the rocker member in close relation to prevent relative pivotal movement of the rocker member and inverted cup-shaped member about a vertical axis defined by the bolt means thereby retaining the foot member properly oriented in a front to rear aspect with respect to the leg member.

4,499,614

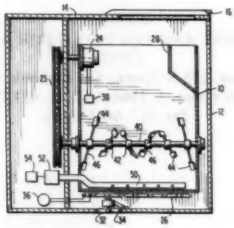
ORGANIC WASTE BIOCONVERTER AND METHOD

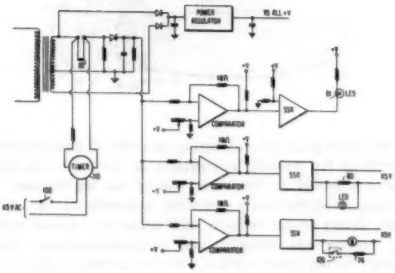
Henry L. Yeagley, 133 Wilson St., Carlisle, Pa. 17013

Continuation-in-part of Ser. No. 940,233, Sep. 7, 1978, abandoned. This application Jun. 30, 1983, Ser. No. 509,506

Int. Cl.³ A47K *11/02*

U.S. Cl. 4—111.1 **8 Claims**





1. A bioconverter comprised of a collecting vessel adapted to contain a bed of material suitable for aerobically converting organic waste matter substantially completely into carbon dioxide and water, mechanical means for stirring the contents of said collecting vessel, electric motor means for driving said mechanical means, first electric heating means associated with said vessel for controlling the temperature of the bed of material within the vessel, fan means for moving a supply of air over the surface of the material within the vessel, manually operable switch means for initiating operation of said electric motor means, said first electric heating means and said fan means, second heating means associated with said fan means for heating the air passing over the mixture, and moisture responsive means mounted in said vessel in a position so as to be located beneath the surface of said mixture for sensing the percentage moisture content thereof for energizing and deenergizing said second heating means when said percentage moisture content exceeds and drops below a first pre-determined value, respectively, and for de-energizing said electric motor means, said first electric heating means and said fan means when said percentage moisture content of the mixture drops below a second pre-determined value lower than said first pre-determined value.

4,499,615

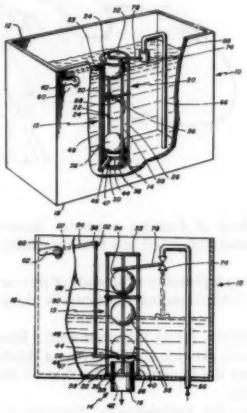
FLUSH AND REFILL DEVICE

Everett S. Radovsky, 4700 N. Main St., Apartment #4J, Fall River, Mass. 02720

Filed Jul. 14, 1980, Ser. No. 168,533

Int. Cl.³ E03D *1/36*

U.S. Cl. 4—366 **6 Claims**



1. A device for flushing and refilling a tank, the tank having an outlet and means for refilling the tank with liquid, said refilling means having an actuator, said device comprising:

a pair of substantially identical floats including an upper float and a lower float;

guide means located within the tank for guiding the floats for movement in a substantially vertical direction, one end of the guide means being disposed in proximity to the outlet and in a manner which guides the lower of the floats into alignment with the outlet, said floats being freely floatable within the guide;

the other end of the guide means being located in the tank with respect to the refilling means so as to guide the upper float toward and away from the actuator of the refill means;

the upper float having a buoyancy sufficient to operate the actuator of the refill means to shut the refill means off when the liquid level in the tank reaches a predetermined upper limit;

the weight and shape of the lower float being such that when the lower float is in seating engagement with respect to the tank outlet, the maximum buoyant effect of the liquid in the tank will be insufficient to dislodge the lower float from said seating engagement; and

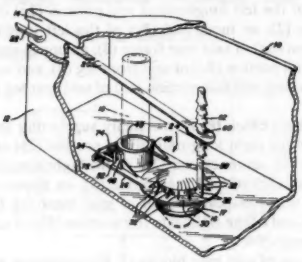
means, independent of the buoyant effect of the liquid in the tank, for dislodging the lower float from its seat on the tank outlet.

4,499,616

FLUSH VALVE

Dwight N. Johnson, El Toro, Calif., assignor to Fillpro Products, Inc., San Marcos, Calif.

Continuation of Ser. No. 927,151, Jul. 21, 1978, abandoned, which is a continuation of Ser. No. 718,048, Aug. 26, 1976, abandoned. This application Jul. 9, 1979, Ser. No. 55,768
Int. Cl.[3] E03D *1/34*
U.S. Cl. 4—393 4 Claims



1. A one-piece flush valve for use with a toilet tank assembly including a flush outlet surrounded by a valve seat; an overflow pipe, and a lift arm movable to initiate flow through said valve seat; said flush valve comprising:

a one-piece, integral body of molded vinyl or similar thermoplastic material; said body including a float member defined adjacent one end thereof;

a planar portion of said body extending laterally from said float member;

a mounting structure formed integrally with said body and including means for mounting said body on the overflow pipe with said float member aligned with the valve seat;

strap means for lifting said body consisting of an elongated graduated lift strap formed integrally at one end with said body adjacent said float member such that said body and strap define a one-piece valve, said strap adapted to extend from said float member to the region of the lift arm, said strap being sufficiently non-stretchy so that when in operation under tension by said lift arm in lifting said float member, it will properly lift said float member, and said strap being sufficiently supple so as not to intefere with the floating of said float, but being sufficiently stiff that no portion of it can fall into said valve seat or otherwise interfere with the valve operation when said float member is floating and the lift arm has been released to its non-lifting position;

attaching means formed adjacent the free end of said lift strap for interconnecting said lift strap and said lift arm and flexure means defined adjacent a second end of said body for allowing said float to flex relative to said second end of said body without undue stress on said body material;

said flexure means including a torque beam defined adjacent a second end of said body laterally spaced from said float, said beam formed integrally vith said planar portion;

said planar portion of said body extending from said float being integrally formed with a first portion of said beam, and said mounting structure including a planar portion formed with said mounting structure and integrally formed with a second portion of said beam; and

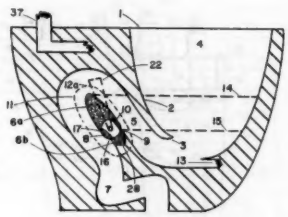
said flexure means further including a first hinge fabricated adjacent said beam on said planar portion of said body extending from said float and a second hinge fabricated adjacent said beam on said planar portion formed with said mounting structure.

4,499,617

WATER CLOSET MODIFICATIONS

John R. Wilhelm, 11605 Split Rail Ct., Rockville, Md. 20852

Continuation of Ser. No. 267,713, May 28, 1981, abandoned. This application Oct. 19, 1983, Ser. No. 542,571
Int. Cl.[3] E03D *11/10*
U.S. Cl. 4—441 10 Claims



1. In a water closet having a bowl, a sewer access volume and a water trap interconnecting the bowl and sewer access volume, the water trap being defined by two side walls, the bowl rear wall and a trap wall extending between the two side walls intermediate the bowl rear wall and the sewer access volume, the improvement wherein:

(a) said trap wall includes a lower portion integral with said water closet and a separate upper portion constructed for insertion as a unit into said water closet for attachment to said integral lower portion;

(b) said water closet includes opening means in one of said side walls disposed relative to said lower portion of the trap wall so that said upper portion of said trap wall may be inserted through said opening means for attachment to said lower portion of said trap wall, means for sealing said opening means, means for providing a seal between said upper portion of said trap wall and said lower portion of said trap wall and means for providing a seal between said upper portion of said trap wall and the respective side walls of said water trap;

(c) said upper portion of said trap wall includes a first partition member and a second partition member supported in spaced relation between a pair of side plates attached to the respective opposite sides of the partition members and affixed to said lower portion of said trap wall, said partition members thereby defining, respectively, the upper and lower extremities of a passageway through said upper portion of said trap wall; and

(d) said upper portion of the trap wall further includes valve means supported by said side plates intermediate said partition members for opening and closing said passageway, whereby the contents of said bowl are constrained to flow over the top of said upper portion of said trap wall for passage to said sewer access volume when said valve means is closed and permitted to flow through said passageway for passage to said sewer access volume when said valve means is open.

4,499,618

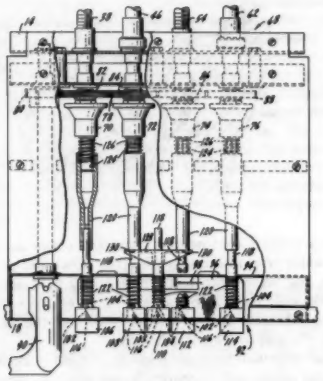
ADJUSTABLE BED WITH SINGLE CRANK AND PUSH-BUTTON CONTROL ASSEMBLY

Lester W. Werner, 4768 Tonga Dr., St. Louis, Mo. 63128

Filed Dec. 1, 1980, Ser. No. 211,540
Int. Cl.[3] A61G *7/10*
U.S. Cl. 5—68 10 Claims

1. An adjustable bed including a relatively fixed frame, a movable frame, a mattress support structure, head and foot lift mechanisms for raising and lowering the head and foot ends respectively of said movable frame, back and knee lift mechanisms for raising and lowering the back and knee sections respectively of said mattress support structure, transmission means engageable for directing torque to said lift mechanisms

for actuation thereof, said transmission means including head, foot, back and knee lift screws respectively in driving relationship with said lift mechanisms, a gear train including a drive gear, and head, foot, back and knee driven gears in meshing relationship with said drive gear, head, foot, back and knee clutches selectively engageable for respectively establishing engagement of said driven gears with said lift screws, a manual crank engaged with said drive gear for rotation of said drive



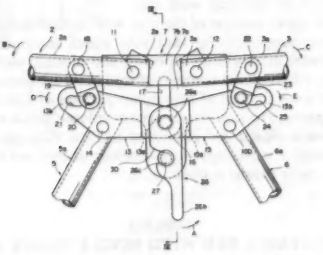
train, means associated with each of the lift mechanisms and its transmission means for stopping movement of the said lift mechanism when the limits of its travel are reached while permitting continued movement of another lift mechanism, manual control means for selectively engaging said transmission means with any number of said lift mechanisms for individual or simultaneous actuation thereof, and means for locking said control means in engaged position.

4,499,619

BABY BED

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Mar. 24, 1983, Ser. No. 478,336
Claims priority, application Japan, Apr. 9, 1982, 57-60124
Int. Cl.³ A47C *29/00*; A47D *7/00*
U.S. Cl. 5—99 A **9 Claims**



1. A baby bed comprising:

a front frame (**2**) having left and right longitudinal rod portions (**2***a*, **2***b*) and a lateral rod portion (**2***d*) for connecting the outer ends (**2***c*) of both said longitudinal rod portions (**2***a*, **2***b*),

a rear frame (**3**) having left and right longitudinal rod portions (**3***a*, **3***b*) and a lateral rod portion (**3***d*) for connecting the outer ends (**3***c*) of both said longitudinal rod portions (**3***a*, **3***b*) and having the inner ends (**3***e*) of both said longitudinal rod portions (**3***a*, **3***b*) disposed in opposed relation with the inner ends (**2***e*) of both said longitudinal rod portions (**2***a*, **2***b*) of said front frame (**2**),

a hammock (**4**) made of a flexible material and suspended from said front and rear frames (**2**, **3**),

front and rear legs (**5**, **6**) adapted to support said front and rear frames (**2**, **3**) and said hammock (**4**) and having left and right side rod portions (**5***a*, **5***b*, **6***a*, **6***b*) and lower rod portions (**5***d*, **6***d*) for connecting the lower ends (**5***c*, **6***c*) of both said side rod portions (**5***a*, **5***b*, **6***a*, **6***b*),

a left base block (**7**) for rotatably supporting an inner end (**2***e*) of the left longitudinal rod portion (**2***a*) of said front frame (**2**), an inner end (**3***e*) of the left longitudinal rod portion (**3***a*) of said rear frame (**3**), an upper end of the left side rod portion (**5***a*) of said front leg (**5**), and an upper end of said left side rod portion (**6***a*) of said rear leg (**6**), respectively,

a right base block (**8**) for rotatably supporting an inner end (**2***e*) of the right longitudinal rod portion (**2***b*) of said front frame (**2**), an inner end (**3***e*) of the right longitudinal rod portion (**3***b*) of said rear frame (**3**), an upper end of the right side rod portion (**5***b*) of said front leg (**5**), and an upper end of the right side rod portion (**6***b*) of said rear leg (**6**), respectively;

at least one of said base blocks (**7**, **8**) comprising a vertically extending elongated guide slot (**17**), a front bracket (**13**) rotatably connected to at least one side portion (**5***a* or **5***b*) of said front leg (**5**), a rear bracket (**15**) rotatably connected to at least one side portion (**6***a* or **6***b*) of said rear leg (**6**),

a vertically movable guide pin (**16**) rotatably interconnecting one end portion (**13***a*) of said front bracket (**13**) and one end portion (**15***a*) of said rear bracket (**15**), said vertically movable guide pin (**16**) being guided for vertical up and down movement in said elongated guide slot,

a front link (**19**) rotatably attached to said longitudinal rod portion (**2***a*) of said front frame (**2**) and rotatably connected to another end portion (**13***b*) of said front bracket,

a rear link (**23**) rotatably attached to the longitudinal rod portion (**3***a*) of said rear frame (**3**) and rotatably connected to another end portion (**15***b*) of said rear bracket (**15**), and

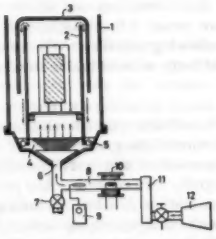
locking means (**26***c*, **27**) operatively arranged for cooperation with said guide pin (**16**) for preventing an upward and downward movement of said guide pin (**16**) when said baby bed is open.

4,499,620

FOAM WASHING METHOD

Motoi Minagawa, Ashiya, Japan, assignor to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 453,906
Claims priority, application Japan, Feb. 23, 1982, 57-27797
Int. Cl.³ D06F *17/12*
U.S. Cl. 8—158 **8 Claims**



1. A foam washing method which comprises forming a large amount of foam by blowing a gas through a concentrated aqueous solution of a detergent, and thereafter bringing only said foam into contact with soiled textile goods without me-

chanical working of said soiled textile goods to separate and remove dirt adhered to fibers of said textile goods.

4,499,621

METHOD FOR WASHING LAUNDRY IN A PASS-THROUGH WASHING MACHINE

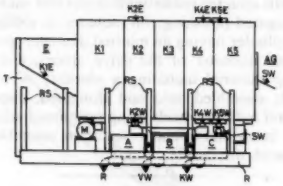
René Gasser, Wolfhausen, Switzerland, assignor to Maschinenfabrik AD. Schulthess & Co. AG, Zurich, Switzerland

Filed Mar. 1, 1983, Ser. No. 471,044

Claims priority, application Switzerland, Mar. 1, 1982, 1244/82

Int. Cl.³ D06F *31/00*

U.S. Cl. 8—158 **9 Claims**



1. A method for washing laundry in a pass-through washing machine of the type having a tube divided into a plurality of chambers by separating walls provided with transfer openings, wherein at least one of the chambers contains wash liquid and at least another one of the chambers contains rinse liquid, the laundry in each of the chambers being treated with liquid during a single cycle, and wherein after completion of said single cycle, the laundry in each chamber is transferred through a transfer opening into a succeeding chamber for treatment with liquid during a succeeding cycle or onto a discharge chute succeeding a final chamber of said plurality of chambers, with the improvements comprising; controlling the treatment time of the laundry in at least one of the chambers, so that the time of a first treatment in that chamber is one-half the cycle time, and after said one-half of the cycle time draining the liquid in that chamber and feeding a second liquid into that chamber for a second treatment of the laundry in that chamber for the remaining time of the cycle, and prior to transferring said laundry into a succeeding chamber or onto said discharge chute.

4,499,622

GRIPPER ASSEMBLY

Derek H. Garner, Leicester, England, assignor to USM Corporation, Farmington, Conn.

Filed Jan. 31, 1983, Ser. No. 462,667

Claims priority, application United Kingdom, Feb. 6, 1982, 8203472

Int. Cl.³ A43D *21/16*

U.S. Cl. 12—14.5 **13 Claims**

1. A gripper assembly for use in a machine for pulling over and lasting toe portions of shoes comprising:

(i) a housing supporting two gripper jaws,

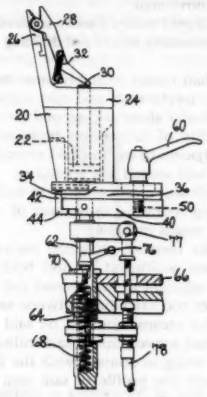
(ii) means supported by the housing for effecting relative movement of approach and separation between said jaws,

(iii) first support plate means supporting said housing,

(iv) second support plate means connected by a pin-and-slot connection to the first support plate means, whereby the position of the latter in relation to the former can be adjusted so as to enable the position of the gripper jaws to be set in relation to shoe support means of a machine of which the assembly forms part, both towards and away from such support means and also along an arcuate path generally lengthwise of said means,

(v) first clamp means for clamping the first support plate means in adjusted position on the second support plate means, said clamp means being manually operable.

(vi) a support shaft on which the second support plate means is supported for adjusting movement about the axis of said shaft whereby also to enable the position of the gripper jaws to be set, generally lengthwise of said shoe support means, in relation to said means, and



(vii) second clamp means for clamping the second support plate means in adjusted position in relation to the support shaft.

4,499,623

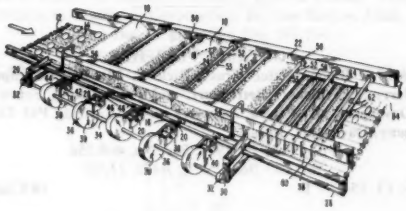
EGG CLEANING APPARATUS

Jeffrey B. Kuhl, Flemington, N.J., assignor to Henry Y. Kuhl, Flemington, N.J.

Filed Jan. 20, 1984, Ser. No. 572,715

Int. Cl.³ A01K *43/00*

U.S. Cl. 15—3.13 **13 Claims**



1. An egg cleaning apparatus comprising:

(a) an egg conveying means for carrying eggs longitudinally through a processing station;

(b) a plurality of cylindrical brushes extending laterally across said egg conveying means and positioned immediately thereabove with the lower portions thereof being in contact with the eggs located therebelow;

(c) a plurality of brush rods each one extending longitudinally through one of said cylindrical brushes and allowing free rotational movement of said cylindrical brushes with respect to said brush rods, said brush rods including a first rod end and a second rod end thereof;

(d) a first mounting means extending longitudinally along one side of said egg conveying means and defining a plurality of first rod apertures therein through which said first rod ends extend for suspending said cylindrical brushes in a position above said egg conveying means, said brush rods being mounted within said first rod apertures with laterally axial freedom of movement;

(e) a second mounting means extending longitudinally along the other side of said egg conveying means and defining a

plurality of second rod apertures therein through which the second rod end of each of said brush rods extend for suspending said cylindrical brushes in a position above said egg conveying means, said brush rods being mounted within said second rod aperture with laterally axial freedom of movement;

(f) a cam support means fixedly secured with respect to said second mounting means and defining cam apertures therethrough;

(g) a camshaft means rotatably mounted extending through said cam apertures of said cam support means to extend longitudinally along said second mounting means;

(h) a plurality of cam means positioned on said camshaft means adjacent to each of said second rod ends extending through said second rod apertures;

(i) a cam follower means secured to said second rod end and preventing rotational movement of said brush rods, said follower means including:

(1) a yoke member including outwardly extending leg members positioned around both sides of said cam means adjacent to said second rod end;

(2) a roller rod extending between said leg members;

(3) a roller means mounted on said roller rod to allow rotational movement of said roller means, said roller means being in contact with the face of the adjacent cam with the profile of said cam means determining lateral movement of said cylindrical brush extending about said brush rod responsive to rotation of said cam means;

(j) a follower spring extending about said second rod end between said yoke member and said second mounting means to urge said roller into continuous contact with respect to the face of said cam means;

(k) a plurality of fluid conduits extending laterally across said egg conveying means at a location above said cylindrical brushes and being adapted to carry cleaning fluids therethrough; and

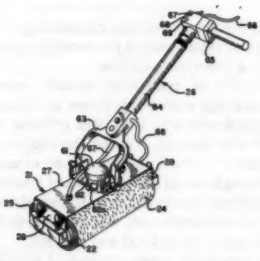
(l) a plurality of outlets defined within said fluid conduits to facilitate dispensing of cleaning fluids onto the cylindrical brushes positioned therebelow.

4,499,624

PORTABLE POLISHER

James A. Bloome, Blue Grass; Rick A. Meeker, Davenport; Jerry T. Whicker, Bettendorf, and Frederick J. Foreman, Davenport, all of Iowa, assignors to The Kartridg Pak Company, Davenport, Iowa

Filed Feb. 25, 1983, Ser. No. 469,756
Int. Cl.[3] B64F 5/00; A47L 11/03
U.S. Cl. 15—97 R **14 Claims**



1. A portable polishing apparatus for surface preparation of substrates comprising:

a frame assembly having handle means mounted thereonto for operator grasping and controlling of the apparatus;

two elongated drive arbors depending from and rotatably mounted with respect to said frame assembly, each said elongated drive arbor having a peripheral surface and an elongated longitudinal axis, each said elongated longitudinal axis being generally parallel to the surface of the substrate being prepared by the apparatus;

an elongated polishing roll securely mounted over the peripheral surface of each of said elongated drive arbors;

motor means for imparting rotational movement, said motor means being in operative interengagement with each of said elongated drive arbors;

drive means operatively engaging said motor means and said elongated drive arbors for transmitting rotational movement from said motor means to one of the elongated drive arbors and its polishing roll in a clockwise direction and to the other of said elongated drive arbors and its polishing roll in a counterclockwise direction, whereby said polishing rolls counter-rotate with respect to each other; and

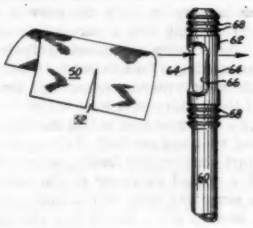
said elongated polishing roll includes an elongated, disposable cylinder having an internal diameter greater than the external diameter of the drive arbors, and a supply of buffing material including a plurality of rotary buffing wheels assembled onto said elongated, disposable cylinder, said buffing wheels being positioned adjacent to each other in an end-to-end orientation assembled onto said elongated, disposable cylinder.

4,499,625

TWO-WAY GUN CLEANER TIP AND BUTTERFLY PATH FOR USE THEREWITH

C. Edward Bottomley, 130 Griffin Rd., West Suffield, Conn. 06093

Filed Oct. 24, 1983, Ser. No. 544,958
Int. Cl.[3] F41C 31/00
U.S. Cl. 15—104.165 **2 Claims**



1. In combination, a gun cleaner reciprocable in forward and retrograde wiping strokes through a gun barrel comprising:

a manually-engageable rod and a flexible planar gun cleaning patch cooperant therewith,

the rod having an elongated longitudinal axis and having a certain diameter with a top at its outboard extremity of a diameter in excess of said certain diameter,

the tip having at the midsection of its length a pair of diametrically-opposed indentations defining a central thinned portion having an axis coincident with the rod axis and a through patch-receiving slot extended centrally of the thinned portion and coaxial with the thinned portion axis and further defining outboard and inboard peripheral bearing surfaces adjacent the opposite extremities of the indentations,

the patch being divisible into four quadrants by a first imaginary central fold line for folding the patch upon itself into a pair of confronting half-parts with each said half-part being divided into a pair of quadrants by a slit extending partially inwardly from its outer free side edge along a second imaginary central fold line intersecting the first fold line at right angles,

the patch being extendable into the slot for the disposition of one of the quadrants of each pair outwardly of one side of the slot and the other of the quadrants of each pair outwardly of the other side of the slot for the draping of the

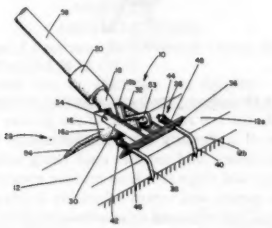
inboard face of the patch for support by the inboard enlargement with the outboard face being exposed for the wiping function on the forward wiping stroke and for the draping of the outboard face of the patch for support by the outboard enlargement with the inboard face being exposed for the wiping function on the retrograde wiping stroke.

4,499,626

BROOM HANDLE HOLDING ATTACHMENT FOR AN INDUSTRIAL BROOM

Earl L. Schneider, Rte. 6, Box 506, Henderson, N.C. 27536

Filed Oct. 21, 1983, Ser. No. 544,254
Int. Cl.³ B25G 3/24, 3/38
U.S. Cl. 15—146 **7 Claims**



1. A broom handle receiver and holder adapted to be readily attached transversely across an elongated bristle holder of a broom, said broom handle receiver and holder comprising: an over-center latching broom handle receiving and holding clamp having first and second arm means for engaging opposite side portions of an elongated bristle holder of a broom; at least one of said arm means being extensible from a contracted position to an extended position and including biasing means for biasing said extensible arm means towards said contracted position; said extensible arm means further including a pair of hook members with each hook member including a hook shaped terminal end portion for engaging and grasping said bristle holder; said biasing means including a spring disposed about a portion of each hook member and is confined by a first stop means fixed to the respective hook member and a second stop means disposed adjacent said hook member but not constrained to move with said hook member in order that said hook member may move relative to said second stop means; an over-center latch pivotly mounted to said first and second arm means and operatively interconnected therebetween, said over-center latch being movable relative to said first and second arm means between a first open position where said arm means assume an expanded non-attached position and a second over-center latch position where said arm means assumes a contracted position and grip the sides of said bristle holder so as to secure said broom handle receiving means secured on said broom handle receiving and holding clamp for receiving a broom handle.

4,499,627

FLEXIBLE SURFACE CLEANING AND COATINGS APPLICATOR TOOL

James H. Gruns, 5080 Woodson Dr., Mission, Kans. 66202

Filed Mar. 17, 1983, Ser. No. 467,300
Int. Cl.³ A46B 9/10
U.S. Cl. 15—210 R **1 Claim**

1. A surface preparation and coatings tool comprised of a handle assembly made of a deformable and reformable thin, flat metal core member encapsulated in a thin plastic sheathing material such that said handle retains a deformed shape when bent into said deformed shape, said core member being uniform in cross-section for its entire length;

said material completely encapsulates said core member through the application of an adhesive and/or sufficient heat so as to bond or fuse said plastic sheathing material to the core members in a manner that completely protects said core members from the corrosive effects of the chemicals contained in common surface preparation and/or surface coating compounds said plastic sheathing material protecting the surfaces adjacent the surfaces coated from being scratched or abraided by the metal core member;

said compounds being absorbed by a resilient, absorbent and/or adsorbent

said absorbent member is mountable to and demountable from the handle assembly so as to be reuseable by affixing to said handle assembly a new and/or clean absorbent member;

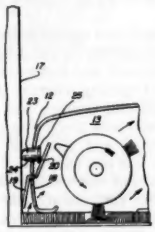
said member is capable of releasing said compounds in a controlled manner; as the compound bearing absorbent member is placed with a sliding motion in contact with the surface to be prepared and/or coated.

4,499,628

VACUUM CLEANING APPARATUS

Clark I. Platt, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 9, 1983, Ser. No. 502,700
Int. Cl.³ A47L 9/02
U.S. Cl. 15—419 **8 Claims**



1. In a vacuum cleaner having a nozzle defining a front wall, means defining a downwardly opening suction chamber rearwardly of the front wall, and means for applying suction to said chamber for picking up dirt from subjacent said chamber, the improvement comprising:

means for providing an opening to said chamber through said front wall;

closure means moveably mounted to said front wall to move forwardly thereof for selectively closing said opening; and

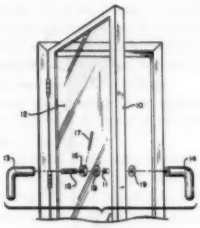
means for sensing the proximity of said front wall to an upright wall surface and for causing said closure means to move forwardly of said front wall to discontinue closing said opening when said nozzle front wall is closely juxtaposed to said upright wall surface.

4,499,629

DOOR PULL MOUNTING AND LOCKING ASSEMBLY

Harvey L. Grossman, Santa Barbara, Calif., assignor to Forms & Surfaces, Santa Barbara, Calif.

Filed May 6, 1983, Ser. No. 492,337
Int. Cl.³ B25G 1/06
U.S. Cl. 16—111 R 3 Claims



1. A door pull mounting and locking assembly for securing first and second door pulls to opposite sides of an opening in a door including, in combination:

(a) a shaft having its opposite ends threaded respectively with left and right hand threads, said threads including thread lock means, a lateral side portion of said shaft being relieved to define a longitudinal channel of given depth;

(b) a disc having a central aperture dimensioned to receive said shaft and a radial bore having a first portion passing from a point on the periphery of said disc into said aperture and a second portion passing into said disc from across said aperture a distance beyond the center of the disc, said second portion of said bore terminating short of the diametrically opposite peripheral point on said disc from said first mentioned point;

(c) a pin secured in said second portion of said bore to extend radially into said aperture a given distance less then the depth of said channel and dimensioned to ride in said channel when said shaft is passed through said aperture and thereby rotatably lock said shaft to said disc while permitting longitudinal movement of said disc along said shaft;

(d) first means in said first door pull defining a threaded opening for receiving in threaded engagement one end of said shaft;

(e) second means in said second door pull defining an oppositely threaded opening for threadedly receiving the opposite end of said shaft, said first and second door pulls being larger than said opening whereby said opposite end can be passed through said opening and said second door pull threaded thereto, said disc being received over said one end of said shaft and said first door pull then being threaded onto said one end; and

(f) an engaging means receivable in said first portion of said bore in said disc for rotating said disc and thereby said shaft in a direction to draw said first and second door pulls towards each other to thereby sandwich the periphery of the door opening therebetween and lock the door pulls to the door, said engaging means then being removed from said first portion of said bore to leave a finished appearance.

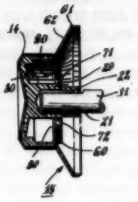
4,499,630

MANUAL CONTROL KNOB WITH ADJUSTABLE POINTER ASSEMBLY

Stephen K. Harris, and Wiley W. Miller, both of Mansfield, Ohio, assignors to The Tappan Company

Filed Sep. 27, 1982, Ser. No. 423,646
Int. Cl.³ G05G 1/10
U.S. Cl. 16—121 9 Claims

1. In a knob assembly for a rotatable shaft of an appliance, the knob assembly having a manually rotatable knob adapted to be affixed to the shaft, and a pointer means angularly displaceably affixed to the knob, the improvement wherein said knob has a rearwardly extending hub with a generally circular cross section and a central aperture for receiving said shaft, an axially extending ridge having its longitudinal extent along and unitary with the outer circumference of said hub, said pointer means comprising an annular element having an outer diameter



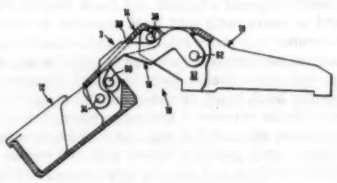
greater than that of said knob and a central aperture for receiving said hub, the central aperture of the pointer means having two groups of a plurality of circumferentially spaced axially extending recesses, said recesses each being adapted to selectively engage said ridge to inhibit relative rotation of the knob and pointer means, and means releasably holding said pointer means on said hub with said ridge extending into a selected one of said recesses.

4,499,631

FURNITURE HINGE PERMITTING DOOR OPENING ANGLE OF 110 DEGREE OR MORE

Gerhard W. Lautenschläger, Bensbach, Fed. Rep. of Germany, assignor to Karl Lautenschläger KG, Möbelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Continuation of Ser. No. 337,086, Jan. 4, 1982, abandoned. This application Jul. 17, 1984, Ser. No. 631,016
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108224
Int. Cl.³ E05D 3/06
U.S. Cl. 16—370 1 Claim



1. A hinge having a door-related part in the form of a cup having a bottom and to be sunk in a recess in a door leaf, and a carcass-related part to be fastened to a carcass of a cabinet, said hinge being movable through an angle of at least 110° from a closed position to an open position and vice versa, first and second hinge links coupling said carcass-related part to said door-related part without said hinge links being pivotally connected to each other, each hinge link having one end journalled at the cup and another end journalled at the carcass-related part, said first hinge link being closer to said bottom than said second hinge link when said hinge is in said closed position and having between its ends an opening of a certain width, said one end of said second hinge link being narrower than the width of said opening in said first hinge link, whereby part of said one end of said second hinge link passes through said opening when said hinge is moved from said closed position to said open position, wherein all the journalled ends of the hinge links remain on the same side of the opening in all

positions of the hinge links, wherein said first hinge link is stamped out of sheet metal and is in the form of a substantially planar elongated metal stamping having at least at its ends lug-like projections bent at right angles from lateral edges of the hinge link, and pivot bores being provided for hinge pins journaling said first hinge link at the cup and at the carcass-related hinge part, respectively, wherein said second hinge link is composed of two sheet metal stampings of substantially equal form and disposed parallel to the lug-like projections of the first hinge link, said stampings being provided at end portions with aligned pivot bores for hinge pins journaling said second hinge link at the cup and at the carcass-related hinge part, respectively, wherein said metal stampings of the second hinge link lie directly against one another at said one end and only said two sheet metal stampings enter into and partially pass through said opening in the first hinge link.

4,499,632

CARDING ENGINE

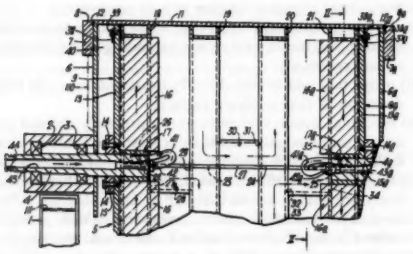
John M. Varga, 2 Lawrence Rd., Skircoat Green, Halifax, W. Yorkshire, England HX3 OLH

Filed Oct. 12, 1982, Ser. No. 433,791

Claims priority, application United Kingdom, Oct. 10, 1981, 8130666

Int. Cl.³ D01G *15/02, 15/16*

U.S. Cl. 19—98 **14 Claims**



1. A carding engine having a hollow carding cylinder, means mounting said cylinder for rotation about a substantially horizontal axis, and bends at each side of the cylinder, in which a fluid-conveying pathway is formed on the inner surface of the cylinder in a pattern such that fluid circulated through the pathway will maintain the surface temperature of the cylinder substantially uniform, the pathway forming at least one continuous fluid path having a discrete inlet and a discrete outlet at opposite extremities thereof.

4,499,633

APPARATUS FOR SEPARATING FIBER TUFTS FROM AN AIRSTREAM

Hermann Trützschler, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

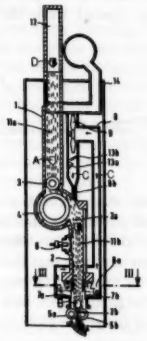
Filed Feb. 10, 1984, Ser. No. 578,807

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304571

Int. Cl.³ D01G *15/40*

U.S. Cl. 19—105 **13 Claims**

1. In an apparatus for forming a lap from fiber tufts, including a generally vertically oriented feed chute having upper and lower ends; means disposed at said upper end for introducing fiber tufts into said feed chute; means disposed at said lower end for discharging a lap from said feed chute; means for maintaining, in said feed chute, an air stream flowing downwardly in the direction of said lower end; and apertured wall means bounding said feed chute along a vertical length portion thereof for providing an exit for the air stream from said feed chute; the improvement wherein said apertured wall means includes first and second separating walls each having a plurality of parallel-spaced, vertically extending slots and webs in an alternating sequence; said slots and webs having a vertical length and a horizontal width; said first and second separating walls being in a parallel, face-to-face relationship and being



spaced from one another by a distance less than the expected smallest size of the tufts; the slots in said first separating wall being staggered in a horizontal direction with respect to the slots in said second separating wall and the width of said slots being greater than the expected largest size of the tufts.

4,499,634

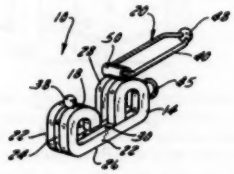
JEWELRY CLASP

Francesco P. Zimmardi, 4137 N. Murray Ave., Milwaukee, Wis. 53211

Filed Apr. 18, 1983, Ser. No. 485,967

Int. Cl.³ F16G *15/00;* **A44B** *13/00*

U.S. Cl. 24—116 A **8 Claims**



1. A jewelry clasp comprising

a main body having a loop at each end, one of said loops being open for detachable connection to a chain, and

a latch assembly mounted on said main body for locking the chain on the open loop, said assembly including

a ball mounted on said open loop, and

a spring detent member mounted for pivotal movement on said other loop, said detent member being pivotal into engagement with said ball.

4,499,635

SHADECLOTH FIXING PIN

Connie T. Ward, Lot No. 1699, McKinnin Rd., Darwin, Northern Territory, Australia

Filed Mar. 9, 1983, Ser. No. 473,455

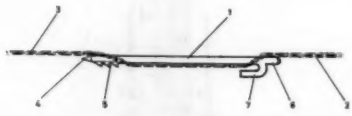
Claims priority, application Australia, Aug. 24, 1982, 525606

Int. Cl.³ A44B *9/00*

U.S. Cl. 24—150 R **4 Claims**

1. A shade cloth stitch pin for joining overlapped portions of tension shade cloth, the pin having an elongate body portion, a

tapered or pointed end on one end of the body portion, gripping means on the body portion adjacent the pointed end to grip and retain the shade cloth, and an abutment member to engage the cloth on the body toward the opposite end of the pin, the abutment member facing the pointed end and being positioned on the same side of the pin as the gripping means and having a portion spaced from the pin and extending



towards said one end, whereby when the pin is inserted through the overlapped portions of shade cloth, and the point again reinserted to be on the same side of the overlapped portions as the abutment member, that the overlapped portions are retained on the pin by the gripping means and the abutment member engaging on the shade cloth, said portion of the abutment member overlying the shade cloth to prevent rotation of the pin.

4,499,636

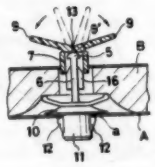
REMOVABLE TWO-PIECE RETAINING MEANS

Toshie Tanaka, Tokyo, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed May 6, 1983, Ser. No. 492,273

Int. Cl.³ A44B *17/00*; F16B *13/04*

U.S. Cl. 24—289 **8 Claims**



1. A fastener, comprising

a male member formed integrally of a flat base, a clipping shank extended downwardly from the lower side of said base, and a pillar raised upwardly from said base and provided at the upper end thereof with a head extended outwardly from the periphery of said pillar, and

a female member formed integrally of a tubular part adapted to be lowered around said pillar of said male member, a pair of elongated depressing blades opposed diametrically to each other and each connected intermediate their length by thin-walled hinges which extend from the upper end of said tubular part, and each of said blades having a short portion thereof extended from said depressing blades below said thin-walled hinges,

said short portion of said blades being formed in a length such that when said tubular part, while in a state having said depressing blades erected in an upright position, is set around said pillar of said male member and subsequently said depressing blades are rotated down to a substantially level position, said short portion of each blade will be brought into mutual surface contact under opposite sides of said pillar head.

4,499,637

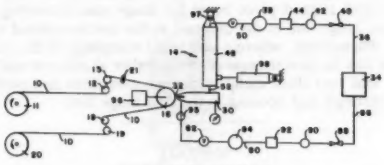
METHOD FOR THE PRODUCTION OF MATERIALS HAVING VISUAL SURFACE EFFECTS

John M. Greenway, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 14, 1979, Ser. No. 103,329

Int. Cl.³ D06C *23/00*

U.S. Cl. 26—2 R **20 Claims**



1. A method for treating a moving substrate traveling in a well defined path by application of pressurized heated gas to the surface of said substrate to modify the surface appearance of said substrate and impart a visual pattern thereto, comprising the steps of:

(a) generating an elongate reservoir of uniformly heated pressurized gas extending across the path of said substrate;

(b) fixing the relative position of said substrate path in spaced but closely adjacent relation to said reservoir;

(c) forming, within said reservoir, a thin, elongate, precisely defined gas stream, said stream extending along the length of said reservoir;

(d) projecting said stream directly from said reservoir in the direction of said substrate surface;

(e) blocking, within said reservoir, a precisely defined portion of said elongate stream at at least one location along its length, thereby dividing said stream into at least two thin, precisely defined heated gas streams which collectively are spaced across the path of said substrate, which streams individually contact corresponding thin, precisely defined areas of said substrate surface, and thereby preventing other areas of said substrate surface opposite said blocked portion of said elongate stream from being contacted by said heated gas stream, said blocking being accomplished by directing a pressurized stream of cooler gas into the path of said elongate stream at said location;

(f) maintaining the temperature of said heated gas stream at a uniform level along the length of said reservoir, said level being sufficient to modify the surface appearance of said substrate; and

(g) moving said substrate on said path and into said projecting streams from said reservoir.

4,499,638

DEVICE FOR INDIVIDUALLY SEPARATING AND ALIGNING HEDDLES FOR THREADING

Heinz John, deceased, late of Berneck, Switzerland, and by Friedlinde John née Rüffler, heir, Gams, Switzerland, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 430,288

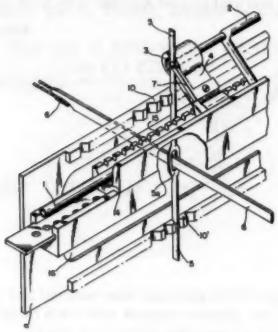
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, 3143484

Int. Cl.³ D03J *1/14*

U.S. Cl. 28—207 **4 Claims**

1. In a device for individually separating drop wires or heddles bunched into a pack on heddle slide rails of a heddle frame, where the particular foremost heddle of a pack is lifted from the pack by a separator associated with the pack and moved by holding means on the heddle slide rail into a position for drawing the warp thread into the heddle eye, and where the holding means of the individual separator is displaceable in the direction of advance of the heddles and can be pivoted from a rest position outside the plane of the pack into an opera-

tional position toward the plane of the pack and toward the plane of advance of the heddles, the improvement comprising rest means (10, 10') mounted in the draw-in area of the heddles (5) laterally next to the plane of advance, said rest means (10, 10') being equipped with a serrated profile, and a projecting part (7), mounted on holding means (3, 4), which upon pivoting of said holding means (3, 4) displaces the heddle (5) into a gap of the serrated profile and upon further pivoting presses the heddle (5) with rotation flatly against a ramp (12) of the sawtooth profile, whereby the heddle eye assumes a substantially transverse position with respect to the path of threading of a warp thread therein.

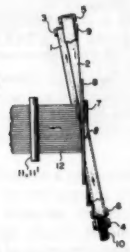


4,499,639

PROCESS FOR BROADENING THE WIDTH OF A BUNDLE OF PARALLEL FILAMENTS HAVING A BAND FORM

Tokio Okada; Haruhisa Tani; Shigezo Kojima; Setsuya Tsuyama; Kazuhiko Kurihara, and Hiroshi Yazawa, all of Tokyo, Japan, assignors to Polymer Processing Research Institute Ltd., Tokyo, Japan

Filed Apr. 27, 1982, Ser. No. 372,132
Claims priority, application Japan, May 1, 1981, 56-66491
Int. Cl.³ D01D *11/02*; D02J *1/18*
U.S. Cl. 28—282 **2 Claims**



1. In a process for broadening the width of an advancing bundle of substantially parallel filaments by holding the bundle so as to form a holding line which is straight and oblique to the advancing direction of the bundle, turning the direction of the bundle having passed through the holding line to a direction at an optional angle against the holding line and taking up the resulting broadened bundle, the improvement which comprises

(a) placing a bundle of parallel filaments as a tow between two upper and lower belts that are circulating at the same speed about spaced apart pairs of pulleys,

(b) passing the bundle of parallel filaments through a press-holding line located intermediate said pairs of pulleys;

(1) which is straight and oblique to the advancing direction of the bundle,

(2) which consists of one non-rotatable elongated cylindrical bar that is disposed oblique to the advancing direction of the belts, and

(3) which is formed by pressing the bundle sandwiched between belts straightly and obliquely to the advancing direction of the bundle along said bar, by tension of the belts which is originated from running the belts around the bar in contact with the periphery of the bar at a definite angle,

(c) after passing through the press-holding line, opening the two belts by deviating one of the belts at the holding line after passing therethrough,

(d) turning the advancing direction of the bundle to a direction at an optional angle against the press-holding line; and

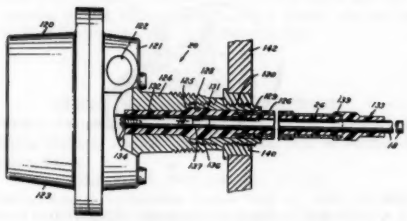
(e) taking up the resulting bundle having the desired broadened width.

4,499,640

METHOD OF MANUFACTURING CAPACITANCE-TYPE MATERIAL LEVEL INDICATOR PROBE

Ronald G. Brenton, Marysville, Mich., and Robin B. Runck, Sherman Oaks, Calif., assignors to Berwind Corporation, Philadelphia, Pa.

Filed Aug. 25, 1982, Ser. No. 411,524
Int. Cl.³ H01G *5/00*
U.S. Cl. 29—25.41 **2 Claims**



1. A method of constructing a capacitance probe for a level indicating system comprising the steps of: (a) providing a solid probe rod, (b) fixturing a hollow tubular guard telescopically surrounding and radially spaced from said probe rod intermediate and spaced from opposing ends of said probe rod, (c) connecting an insulated electrical wire to said guard and affixing said wire to said probe rod so as to extend at least to one end of said rod, (d) injection molding insulation material in a one-piece unitary construction surrounding said probe rod and between said probe rod and said guard and radially surrounding one end of said guard, a portion of said probe rod and at least a portion of said guard remote from said one end being exposed, and (e) mounting the molded assembly within a nipple adapted for mounting the assembly to a material vessel.

4,499,641

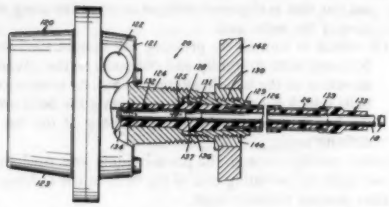
METHOD OF MANUFACTURING CAPACITANCE-TYPE MATERIAL LEVEL INDICATOR PROBE

Phillip P. Fleckenstein, Port Huron, Mich., assignor to Berwind Corporation, Philadelphia, Pa.

Filed Sep. 20, 1982, Ser. No. 419,776
Int. Cl.³ H01G *5/00*
U.S. Cl. 29—25.41 **1 Claim**

1. A method of constructing a capacitance probe for a level indicating system comprising the steps of: (a) providing a solid probe rod, (b) fixturing a hollow tubular guard telescopically surrounding and radially spaced from said probe rod and axially spaced from at least one end of said probe rod, (c) injection

molding insulation material in a one-piece unitary construction surrounding said probe rod between said probe rod and said guard and radially surrounding axially spaced ends of said guard, said one end of said probe rod and a portion of said



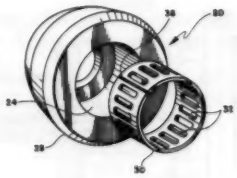
guard intermediate said spaced ends being radially exposed through said insulation material, and (d) mounting the molded assembly within a nipple adapted for assembly to a material vessel.

4,499,642

COMPOSITE BEARING

Edward Vezirian, Irvine; Richard J. Quinones, Garden Grove, and Alan W. Lockstedt, Westminister, all of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 28, 1981, Ser. No. 334,499
Int. Cl.³ B21D *53/10*
U.S. Cl. 29—149.5 R **3 Claims**



1. A method of producing a composite radial friction bearing comprising the steps of:

forming a right-cylindrical bearing tube of a first metal,

forming a multiplicity of fenestrations in said tube in a predetermined pattern,

placing a second metal which metallurgically wets said tube in said fenestrations and filling said fenestrations to a depth approximately equal to one-half a thickness of said tube,

placing a third metal which metallurgically wets said second metal and said tube in said fenestrations and completely filling said fenestrations, and

machining cylindrical surfaces of said right-cylindrical composite bearing tube to predetermined dimensions, forming thereby a first composite bearing surface presenting areas of said first metal and said second metal, and a second bearing surface presenting areas of said first metal and said third metal, said third metal being generally similar to said second metal.

4,499,643

PROCESS FOR MANUFACTURING A PISTON RING

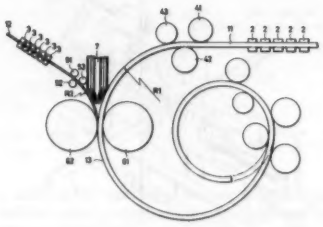
Hiroshi Ikutake, Saitama, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1983, Ser. No. 510,119
Claims priority, application Japan, Jul. 1, 1982, 57-112592
Int. Cl.³ B23P *15/08*
U.S. Cl. 29—156.6 **5 Claims**

1. In a process for manufacturing a piston ring by forming a piston ring material in the shape of a wire rod into a ring by plastic deformation with a predetermined radius of curvature, and applying a different material to the outer periphery of said piston ring material, the improvement which comprises:

the first step of preparing a base piston ring material in the form of a wire rod and a second member in the form of a wire rod, and then feeding said base material and said second member from different directions;

the second step of melting by heat those portions of said base material and said second member which are to be joined;



the third step of bringing said base material and said second member into intimate contact with each other and bonding to form a composite piston ring stock;

the fourth step of bending said stock into a helix with a predetermined radius of curvature and with said second member positioned on the outer peripheral surface of said helix;

the fifth stop of severing said helix to form a split piston ring having spaced ends; and

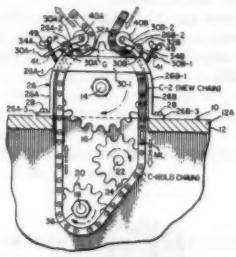
the sixth step of heat treating said piston ring.

4,499,644

APPARATUS FOR REPLACING A CHAIN

George M. Goldsby, Rte. 1, Ripley, Tenn. 38063

Filed Jul. 26, 1983, Ser. No. 517,399
Int. Cl.³ B25B *27/14*
U.S. Cl. 29—281.6 **10 Claims**



1. A fixture for use in removing a worn chain and for replacing said worn chain with a replacement chain, said fixture comprising a shroud member adapted to be detachably mounted outwardly of and in closely spaced chain guiding relation to at least an accessible portion of the chain path so as to provide an outer bounding and retaining means for a chain moving along said portion of said path, said chain path extending about at least two sprockets, and in which said shroud includes a first shroud portion mounted contiguous the chain path about a first portion of one of said sprockets, and a second shroud portion mounted contiguous said chain path about another portion of said one sprocket, an access opening in said shroud member to permit connection of said replacement chain in series with said worn chain, to permit inward feeding through said access opening of the series connected replacement chain, and to permit discharge through said access opening of said worn chain, said access opening being located

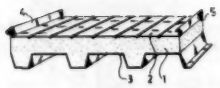
between said first and said second shroud portions, and means connecting said first and said second shroud portions to each other.

4,499,645

PROCEDURE FOR MANUFACTURING A ROOF ELEMENT

Asko Luomanen, Karvia, Finland, assignor to Kone OY, Helsinki, Finland

Filed May 16, 1983, Ser. No. 495,110
Int. Cl.³ B23P *9/00*
U.S. Cl. 29—445 **1 Claim**



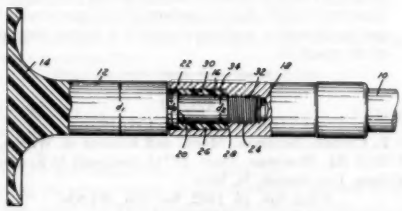
1. A manufacturing procedure for a roof element, comprising foaming or affixing by gluing a thermal lagging such as polyurethane in the space between two spaced upper and lower metal sheets located between moulds, said top sheet having co-planar longitudinal edges that extend outwardly beyond said lagging that are to be formed into a folded profile for machine joining to an adjacent roof element, and, wherein subsequent to foaming or affixing the lagging material, deforming by roller forming techniques said free longitudinal edges of the top sheet to profile the joining folds required for joining to adjacent roof elements by machine.

4,499,646

METHOD OF ATTACHING A METAL SHAFT TO A CERAMIC SHAFT AND PRODUCT PRODUCED THEREBY

Richard L. Allor, Livonia, and John C. Caverly, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 7, 1983, Ser. No. 511,438
Int. Cl.³ B23P *16/02*; F16D *1/00*; F16B *4/00*
U.S. Cl. 29—447 **2 Claims**



1. A method of attaching a metal shaft to a ceramic shaft having a first diameter, characterized by the steps of:

forming on the ceramic shaft a shaft portion having a second diameter less than the first diameter of the ceramic shaft, said shaft portion extending from a free end of the ceramic shaft along a portion of the length of the ceramic shaft to a terminal end thereof where the ceramic shaft has a raised portion formed thereon having a third diameter less than the first diameter but greater than said second diameter, said free end of said shaft portion having threads formed thereon;

placing on said shaft portion of the ceramic shaft in an encircling relationship therewith a circular shaped expansion sleeve which has an internal diameter slightly greater than said second diameter of said shaft portion of the ceramic shaft, said expansion sleeve extending along said shaft portion from a location adjacent a termination of said threads on said shaft portion of the ceramic shaft to said raised portion of the ceramic shaft;

cooling the ceramic shaft and said expansion sleeve to contract said mentioned members;

assembling with said cooled members a metal shaft formed so as to have both an axially hollow interior portion having a diameter slightly greater than said third diameter of said raised portion of the ceramic shaft and an internally threaded hollow portion formed coaxially with said hollow interior portion of the metal shaft, said internally threaded hollow portion being mateable with said threads formed on said free end of said shaft portion, said assembly being carried in a manner such that (A) said threads on said free end of said shaft portion are engaged with said threads formed on said internally threaded portion of said metal shaft, and (B) said expansion sleeve is trapped in a volume defined by said shaft portion of the ceramic shaft, said hollow interior portion of said metal shaft, said raised portion of the ceramic shaft, and a closed end of said hollow interior portion of said metal shaft.

4,499,647

BLIND NUT FASTENING METHOD

Yoshikazu Sakamura, 6-24, Uehonmachi Nishi 2-chome, and Mitsue Majima, 2-1, Tanimachi 7-chome, both of Minami-ku, Osaka, Japan

Filed Sep. 7, 1982, Ser. No. 415,282
Claims priority, application Japan, May 11, 1982, 57-79438
Int. Cl.³ B21D *39/00*; B23P *11/00*
U.S. Cl. 29—509 **2 Claims**

1. A blind nut fastening method comprising:

using: a blind nut including a tubular body having a uniform outer diameter, a flanged head portion extending outwardly at an upper end of said tubular body, an inner bore through said tubular body having an unthreaded thinner neck portion at an upper section of the bore end and a female threaded portion at a lower section of said bore with a smaller diameter than said unthreaded neck portion; a separate cylindrically-shaped sleeve having a lower frusto-conical-formed inwardly-beveled end whose maximum outer diameter at the outer surface of said sleeve is substantially larger than the inner diameter of the bore of the neck portion of said blind nut, and the minimum outer diameter approximately at a bore through said sleeve is

smaller than said inner diameter of said bore, said beveled end being longer in the axial direction than the thickness of an object to which said blind nut is to be fastened; said beveled end being free to slide into said bore of said blind nut at said neck portion for expanding said neck portion; and, an elongated shaft-shaped spindle having male threads at one end thereof engagable with the female threads of said blind nut;

inserting said blind nut into an aperture of an object article;

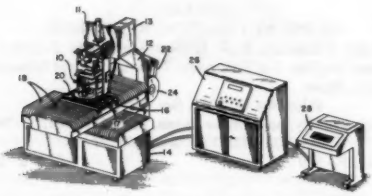
inserting said spindle through said sleeve and into said blind nut and thereafter rotating said spindle so that said male threads of said spindle mesh with said female threads of said nut to thereby pull said lower section of said inner bore toward said head portion for expanding and deforming the part not provided with said female thread portion of said tubular body in the radial and external direction and for simultaneously driving said conical beveled end of said cylindrically-shaped sleeve down between said neck portion of said nut and the elongated shaft-shaped spindle to expand and deform said neck portion of said tubular body disposed adjacent to said aperture for the entire length of said aperture, thereby butting the resulting expanding portion against the inner peripheral side of said object article.

4,499,648

AUTOMATIC WIRING APPARATUS WITH ROTATABLE INSERTION TOOLING

Christopher K. Brown, Camp Hill; Lex D. Kensinger, Annville; William R. Over, and Donald A. Wion, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 29, 1982, Ser. No. 426,455
Int. Cl.³ B23P *23/00*
U.S. Cl. 29—564.2 **10 Claims**



1. Apparatus for electrically connecting first and second spaced apart terminals which are fixed relative to a planar substrate, each terminal comprising a plate-like member having a wire receiving slot extending toward said substrate, said slots in said plate-like members being substantially linear, substantially parallel to each other, and substantially perpendicular to the plane of said substrate, said apparatus comprising:

an X-Y table on which said substrate is fixed, said X-Y table having independently operable X-axis and Y-axis moving means for moving said substrate in the plane thereof,

wire feed means for feeding wire from a substantially endless source toward said substrate,

insertion means for inserting a portion of said wire into said slot, said insertion means comprising a wire inserter located adjacent said substrate, said inserter being movable perpendicularly relative to said substrate, said insertion means being rotatable about an axis perpendicular to the plane of said substrate,

said insertion means further comprising a rotation housing having a circular cam track thereon which is concentric to the axis of rotation, said track having a follower therein which moves perpendicularly relative to said board, said housing moving perpendicularly relative to said board to effect like movement of said inserter regardless of the angular position of the insertion means,

control means for coordinating the feeding of wire toward said substrate, the rotation of said insertion means, and the movement of said X-Y table, whereby,

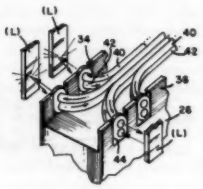
first and second terminals having plate-like members at an angle relative to each other may be electrically connected by positioning a first portion of said wire against said slot in said plate-like member of said first terminal transverse to said plate-like member and inserting said first portion therein, subsequently moving said X-Y table, rotating said insertion means through a like angle, and feeding said wire so that a second portion thereof is against said slot in said plate-like member of said second terminal transverse to said plate-like member, then inserting said second portion therein.

4,499,649

ALL LEAD SENSOR

Richard B. Maxner, Danvers, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Aug. 11, 1982, Ser. No. 407,293
Int. Cl.³ H05K *3/30;* **B21F** *11/00*
U.S. Cl. 29—566.3 **3 Claims**



1. In a component inserting machine, a sensor for indicating that leads of the component are located down through their proper opening in the printed circuit board, comprising:

a. a cut-clinch mechanism carried by the machine and located below the printed circuit board and adapted to cut and clinch the component leads to attach the component to the board;

b. said cut-clinch mechanism comprising a block carrying opposed fixed knives angularly disposed below the board and movable knives coacting with the fixed knives to cut and clinch the component leads extending down through the board;

c. a fiber optics sensor associated with the cut-clinch mechanism and adapted to sense whether the component leads are in position down through the board prior to the operation of the cut-clinch mechanism;

d. said sensor comprising a housing carried on said block between said fixed knives, said housing having a plurality of openings spaced the approximate spacing of the component leads with fiber optic input and output filaments positioned in said openings to sense the presence of the component leads wherein the fiber optic sensor is located within the cut-clinch mechanism and said input and output filaments transfer light to reflect off the component leads and coact with a machine control for proper functioning of the machine.

4,499,650

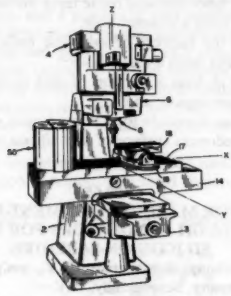
AUTOMATIC TOOL CHANGER

Lee E. Cannon, Bozeman, Mont., and Kentner B. Wilson, 801 Villard Rd., Bozeman, Mont. 59715, assignors to Kentner B. Wilson, Los Alamos, N. Mex.

Filed Jun. 24, 1982, Ser. No. 391,636
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **10 Claims**

4. In a machine tool comprising a spindle for holding a tool, a laterally movable machine tool table for supporting a workpiece, X-axis and Y-axis motors for operatively positioning said

table and said workpiece relative to said tool, and a carousel supported by said machine tool table having a plurality of tool



stations, an improvement comprising means for selectively rotating said carousel, wherein said means comprises said X-axis and Y-axis motors.

4,499,651

METHOD OF MANUFACTURING A FIELD-EFFECT TRANSISTOR

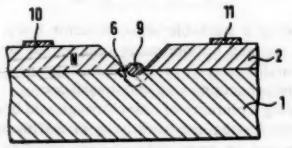
Erhard Kohn, Leingarten, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Aug. 10, 1983, Ser. No. 521,938

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3230945

Int. Cl.³ H01L *21/467, 29/76*

U.S. Cl. 29—571 **20 Claims**



1. A method of manufacturing a field-effect transistor comprising a substrate and an epitaxial layer thereon, wherein a V-shaped trench which extends from the surface of the epitaxial layer into the substrate is created, and a zone is formed by means of implantation in at least the area of the substrate located in front of and bordering the V-shaped trench.

4,499,652

METHOD OF FORMING A MOSFET WITH BOTH IMPROVED BREAKDOWN RESISTANCE AND LESS HOT-ELECTRON EFFECTS

Rituparna Shrivastava, Denton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Sep. 15, 1983, Ser. No. 532,259

Int. Cl.³ H01L *21/265*

U.S. Cl. 29—571 **3 Claims**

1. A method of forming a field-effect transistor comprising the steps of:

forming a gate oxide layer on a substrate;

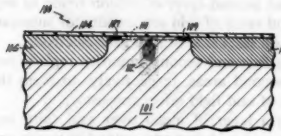
forming an active region of predetermined channel width along a first axis by implanting a threshold ion dose of one conductivity type, having a threshold dose magnitude, through said oxide layer for the purpose of producing a predetermined transistor threshold voltage;

forming a subsurface doped region, having a subsurface length and of a subsurface conductivity type, by implanting a predetermined dose of ions of said subsurface conductivity type, and having a maximum ion density at a predetermined subsurface depth;

forming a gate above said channel region, having a gate length along a second axis in said channel region perpendicular to said first axis; and

forming source and drain regions in said substrate on either side of said gate length and across said channel width, whereby a channel region is defined in said substrate below said gate, having a channel length substantially equal to said gate length and being bounded by said source and drain regions; characterized in that:

said subsurface doped region is implanted through a single



blocking-implant aperture having said subsurface length along said second axis and less than said gate length, lying wholly within said gate length and being substantially centered with respect to said gate;

said subsurface conductivity type is said one conductivity type, so that the conductivity type of said active region within said subsurface length is the same as the conductivity type of said active region outside said subsurface length; and

said blocking ion concentration has a substantial predetermined tail magnitude within said channel region, whereby said transistor threshold voltage is determined by the combination of said threshold dose magnitude and said tail magnitude.

4,499,653

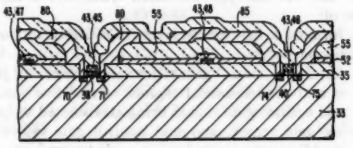
SMALL DIMENSION FIELD EFFECT TRANSISTOR USING PHOSPHOROUS DOPED SILICON GLASS REFLOW PROCESS

Francis J. Kub, Pasadena, and William M. Evey, Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 3, 1983, Ser. No. 548,547

Int. Cl.³ H01L *21/94*

U.S. Cl. 29—571 **19 Claims**



1. A process for fabricating semiconductor devices including a field effect transistor and first and second levels of interconnections on a semiconductor substrate comprising the steps of:

forming a first layer of silicon oxide over said semiconductor substrate,

forming a window in said first layer of silicon oxide,

forming a second layer of silicon oxide on said semiconductor substrate in said window,

forming a layer of polycrystalline silicon over said first and second layers of silicon oxide,

defining said layer of polycrystalline silicon to form the gate electrode of said field effect transistor in said window and

to form conductive paths to provide said first level of interconnections,

forming a layer of silicon nitride over said first and second layers of silicon oxide, said gate electrode, and said first level of interconnections,

forming a third layer of silicon oxide doped with phosphorus over said layer of silicon nitride,

defining said third layer of silicon oxide including removing said third layer of silicon oxide over said window and outside said window by a predetermined distance,

reflowing said third layer of silicon oxide whereby the upper surface of said third layer of silicon oxide is smoothed and its edges rounded,

removing selected portions of said silicon nitride layer and of said second layer of silicon oxide to expose first and second areas of said semiconductor substrate in said window on each side of said gate electrode,

forming first and second impurity regions below said first and second areas, respectively, to form the source and drain of said field effect transistor,

forming a layer of metal over said third layer of silicon oxide, and said first and second impurity regions, and

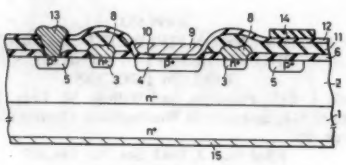
defining said layer of metal to form conductive paths to said first and second impurity regions and to form conductive paths to provide said second level of interconnections.

4,499,654

METHOD FOR FABRICATING SEMICONDUCTOR PHOTODETECTOR

Junichi Nishizawa, No. 6-16, Komegafukuro 1-chome, Sendai-shi, Miyagi, Japan; Soubei Suzuki, and Takashige Tamamushi, both of Miyagi, Japan, assignors to Kimocjo Nishazawa, Japan

Filed Dec. 13, 1983, Ser. No. 561,120
Int. Cl.³ H01L *21/22, 21/265*
U.S. Cl. 29—571 **4 Claims**



1. A method for fabricating a photodetector comprising at least one vertical-type induction transistor, comprising the steps of:

a. forming a field oxide layer on a first main surface of a silicon wafer;

b. forming a control gate region and a shielding gate region in said predetermined regions of said first main surface, said control gate region being surrounded by said shielding gate region, and said control gate region and said shielding gate region having oxide layers formed thereon;

c. removing at least a portion of said field oxide layer in a region between said control gate region and said shielding gate region to partially expose said first main surface of said silicon wafer;

d. forming a first main electrode region in the exposed portion of said first main surface of said silicon wafer;

e. forming an electrode of a first conductive material on said first main electrode region;

f. covering the entirety of said first main surface of said silicon wafer with a first insulating layer;

g. removing portions of said first insulating layer from said control gate region;

h. covering the entirety of said first main surface of said silicon wafer with a second insulating layer;

i. forming an electrode of a second conductive material on said second insulating layer on said control gate region;

j. removing portions of said second insulating layer, said first insulating layer and said oxide layer on said shielding gate region to form a contact hole;

k. covering the entirety of said first main surface of said silicon wafer with a metal layer;

l. removing at least a portion of said metal layer on said control gate region; and

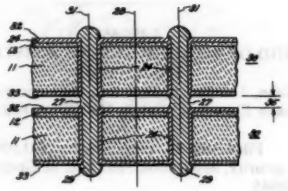
m. forming an electrode for a second main electrode region on a second main surface of said silicon wafer.

4,499,655

METHOD FOR MAKING ALIGNMENT-ENHANCING FEED-THROUGH CONDUCTORS FOR STACKABLE SILICON-ON-SAPPHIRE

Thomas R. Anthony, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 244,854, Mar. 18, 1981, Pat. No. 4,394,712.
This application Nov. 29, 1982, Ser. No. 445,350
Int. Cl.³ H01L *21/28*
U.S. Cl. 29—576 J **15 Claims**



1. A process for making alignment-enhancing electrically conductive feed-through conductors in a body comprising the steps of:

(a) providing a stackable semiconductor body, said body having top and bottom major opposed surfaces substantially parallel to each other and an outer peripheral edge area interconnecting said major surfaces;

(b) providing a plurality of holes through said body, each of said holes having apertures lying in said major opposed surfaces and an inner surface interconnecting said apertures;

(c) depositing a first thin layer of a first metal onto each of said inner surfaces;

(d) applying a second thin layer of a second metal over each of said first thin layers; and

(e) filling the remaining hole volume with a third metal forming thereby an alignment-enhancing electrically conductive feedthrough in a stackable semiconductor body.

4,499,656

DEEP MESA PROCESS FOR FABRICATING MONOLITHIC INTEGRATED SCHOTTKY BARRIER DIODE FOR MILLIMETER WAVE MIXERS

Walter Fabian, Burlington, and Frank H. Spooner, Concord, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,232
Int. Cl.³ H01L *21/20, 21/302*
U.S. Cl. 29—576 E **37 Claims**

1. A method for fabricating semiconductor devices on a non-centrosymmetric semi-insulating substrate, comprising:

disposing a heavily doped contact layer on said substrate,

disposing a lightly doped active layer on said contact layer,

orienting said substrate in a predetermined crystallographic direction,

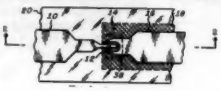
selectively removing a first region of said active layer and a portion of said contact layer underlying said first region,

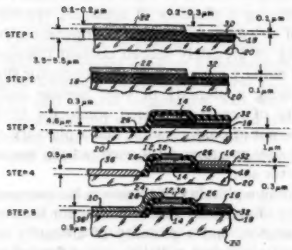
metallizing said contact layer in said first region to form an ohmic contact,

preferentially removing a second region of said active layer, a portion of said contact layer underlying said active layer in said region, and a portion of said substrate underlying said contact layer in said region, said second region longitudinally disposed proximate to and spaced apart from said metallized region, a portion between said first and second regions defining a third intermediate region, the boundary between said second and third regions defining a step region disposed in said predetermined crystallographic direction,

depositing an insulating layer over said metallized first region, said second region, said third region, and said step region,

depositing a layer of photoresist over said insulating layer,





exposing said photoresist through mask means in said second and third regions, said exposure selectively focused to pattern said second and third regions excluding said step region,

exposing said photoresist through further mask means focused to pattern said step region,

developing said photoresist,

selectively removing regions of said insulating layer to expose said second patterned region, said step patterned region, and said third patterned region,

metallizing said first, second, and third patterned regions, and

further metallizing by means of an overlay disposed thereupon said second patterned region, a portion of said third patterned region, and said step patterned region, whereby said regions are integrally electrically contiguous.

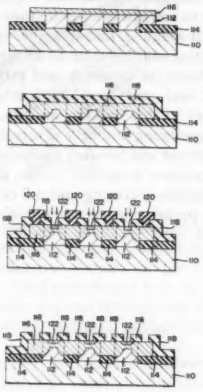
4,499,657

METHOD OF MAKING A SEMICONDUCTOR DEVICE HAVING PROTECTED EDGES

Hirotomo Ooga, and Hiromi Sakurai, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 125,866, Feb. 29, 1980, abandoned.
This application Aug. 2, 1982, Ser. No. 404,051
Claims priority, application Japan, Mar. 26, 1979, 54-37472
Int. Cl.³ H01L *21/20, 29/04*
U.S. Cl. 29—578 **4 Claims**

1. A process of manufacturing a semiconductor device having protected edges, said process comprising the steps of providing a semiconductor substrate of a first conductivity type having a relatively high impurity concentration and having a pair of opposite main faces, forming an electrically insulating film on one of the pair of main faces of said semiconductor substrate so as to include a plurality of openings in a predetermined pattern thereon, epitaxially growing a semiconductor layer with a relatively low impurity concentration on said electrically insulating film including said openings to form a single crystalline grown layer portion on each of said openings and polycrystalline grown layer portions on portions of said electrically insulating film including no opening respectively, doping said epitaxial grown layer with a second conductivity type imparting impurity so as to form an external base region of said second conductivity type in each of said polycrystalline grown layer portions to reach said electrically insulating film and so as to also form an internal base region of said second type conductivity in each of said single crystalline grown layer



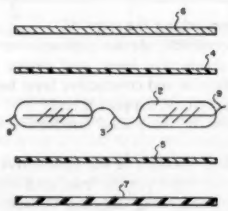
portions to be electrically connected to adjacent ones of said external base regions and so as to form a pn junction therebetween, wherein said internal base regions and said external base regions are formed through the utilization of a difference in their diffusion rates forming an emitter region of said first conductivity type on each of said internal base regions so as to be shallower than the associated internal base region, and forming a base electrode, an emitter electrode and a collector electrode in ohmic contact with each of said external base regions, each of said emitter regions and the other of the pair of main faces of said semiconductor substrate respectively, wherein said insulating film is formed so as to cover the edges of said internal base region or said external base region.

4,499,658

SOLAR CELL LAMINATES

Kathrine J. Lewis, Canoga Park, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 6, 1983, Ser. No. 529,456
Int. Cl.³ H01L *31/18, 21/56;* **C09J** *5/06*
U.S. Cl. 29—588 **9 Claims**



1. In a method for forming a photovoltaic cell module lami-

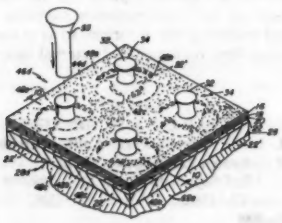
nate composed of at least one photovoltaic cell circuit sealed in a polymer, a solid superstrate, bonded to said polymer on the upperside of said cell and a solid substrate bonded to said polymer on the bottom side of said cell circuit, the improvement comprising providing upper and lower layers of uncrosslinked ethylene/vinylacetate copolymer adjacent the top and bottom of said cell circuit, said ethylene/vinylacetate copolymer layers having dispersed therein at least one peroxide initiator to crosslink said ethylene/vinylacetate copolymer and at least one organosilane monomer primer to promote bonding of said ethylene/vinylacetate copolymer to said cell circuit, superstrate and substrate, said initiator being present in an amount of no more than 1 weight percent based on the total weight of said ethylene/vinylacetate copolymer, said primer being present in an amount of no more than 0.5 weight percent based on the total weight of said ethylene/vinylacetate copolymer, and subjecting said laminate to an elevated temperature for a time sufficient to crosslink said ethylene/vinylacetate copolymer and seal said crosslinked ethylene/vinylacetate copolymer layers to one another around said cells thereby completely encapsulating said cells in crosslinked ethylene/vinylacetate copolymer and bonding said crosslinked ethylene/-vinylacetate copolymer to said cell circuit, substrate and superstrate without separately coating said cell circuit, substrate and superstrate with primer prior to said crosslinking and bonding step.

4,499,659

SEMICONDUCTOR STRUCTURES AND MANUFACTURING METHODS

Michael G. Varteresian, Watertown, and S. Robert Steele, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 18, 1982, Ser. No. 435,004
Int. Cl.³ H01L *21/461, 21/78*
U.S. Cl. 29—589 **7 Claims**



5. A method comprising the steps of:

forming a semiconductor device disposed over a first surface of a plated conductive layer, said device and a second opposite surface of said conductive layer being supported by a plated apertured support layer;

masking portions of the plated conductive layer and the support layer;

etching unmasked portions of the conductive layer to provide at least one finger portion from such conductive layer said finger portion being disposed between masked portions of the conductive layer and such support layer; and

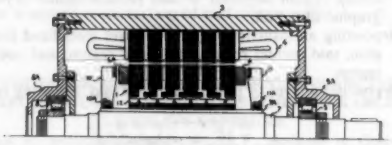
removing the apertured support layer and portions of the unetched portions of the conductive layer.

4,499,660

METHOD OF MAKING A LAMINATED ROTOR FOR A DYNAMOELECTRIC MACHINE

Henry G. Lenz, Scotia, N.Y., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 95,024, Nov. 16, 1979, Pat. No. 4,286,182. This application Jul. 6, 1981, Ser. No. 280,574
Int. Cl.³ H02K *15/02*
U.S. Cl. 29—598 **4 Claims**



1. A method of manufacturing a laminated rotor having cast conductor bars, axially extending coolant passageways and radial coolant ducts comprising the steps of:

(a) providing a first set of a plurality of main rotor laminae each having a plurality of arcuately spaced conductor slots of a first predetermined configuration therein and a plurality of arcuately spaced coolant passageways positioned radially inward from the conductor slots,

(b) providing a plurality of vent laminae each having a plurality of arcuately spaced conductor slots of a first predetermined configuration, and a plurality of arcuately spaced vent apertures positioned radially inward from the conductor slots,

(c) providing a plurality of transition laminae each having a plurality of arcuately spaced conductor slots of a selected configuration, and a plurality of arcuately spaced vent apertures positioned radially inward from the conductor slots,

(d) providing a plurality of duct laminae each having a plurality of arcuately spaced conductor slots of a selected configuration, a plurality of arcuately spaced coolant passageways positioned radially inward from the conductor slots, and a plurality of radial ducts, each of said ducts being positioned between a pair of said conductor slots,

(e) stacking all of said laminae to form sets of laminae, each set comprising a group of main rotor laminae stacked next to a group of vent laminae and at least one transition lamina stacked between said group of vent laminae and a group of duct laminae, and

(e-1) stacking a plurality of said sets on one another, with a transition lamina stacked between each of said sets,

(e-2) aligning all of the stacked sets of laminae, and all of the transition laminae between said sets, so each conductor slot therein is in general alignment with conductor slots in the next adjacent laminae in the stack, and so the conductor slots in said transition laminae do not overlap any part of the ducts in adjacent duct laminae, and

(f) casting conductors in said conductor slots to form continuous conductors extending axially the full length of said stacked sets of laminae,

(g) making said first predetermined conductor slot configuration in the main rotor laminae wider at its widest part than the distance between adjacent ducts in said duct laminae, and

(h) making said selected conductor slot configuration in said transition laminae narrower at its widest part than the distance between adjacent ducts in said duct laminae, whereby the transition laminae block casting metal from the ducts when conductors are cast in the conductor slots.

4,499,661

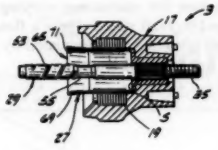
METHOD OF FABRICATING DIE CAST ROTOR WITH ONE PIECE OIL RETURN/ROTOR SHAFT SECUREMENT MEMBER

C. Theodore Peachee, Jr., St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 416,233, Sep. 9, 1982, abandoned, which is a division of Ser. No. 358,477, Mar. 15, 1982, abandoned. This application Jan. 13, 1984, Ser. No. 570,669

Int. Cl.³ H02K *15/02*

U.S. Cl. 29—598 **2 Claims**



1. A method of fabricating a rotor assembly for an electric motor, said rotor assembly having a central longitudinal axis about which it is rotated when installed in said motor, said rotor assembly comprising a die cast rotor body, a core comprising a stack of laminations of suitable ferromagnetic material, said core having a central opening therethrough, an oil return tube coaxial with said longitudinal central axis, a rotor shaft coaxial with said central longitudinal axis, and a rotor shaft mounting member fixed with respect to said rotor body and fixedly receiving said rotor shaft so that said rotor shaft is rotatable with said rotor body, said method comprising the steps of:

forming a one-piece oil tube and rotor shaft mounting member so that said oil tube and said rotor shaft mounting member are integral and so that the one piece member has a shoulder between said oil tube and said rotor shaft mounting member;

inserting said one-piece member into the central opening of said core so that the core is positioned on the outer surface of said oil return tube at a predetermined position therealong;

placing said core and said one-piece member in the die cavity of a die casting machine so that at least portions of said oil tube, said rotor shaft mounting member, and said shoulder of said one-piece member form die casting mold surfaces;

die casting molten metal around said one-piece member and around said core so as to die cast said one-piece member and said core in place within said die cast rotor body; and

fixedly securing said rotor shaft to said rotor shaft mounting member of said one-piece member.

4,499,662

INJECTION MOLDING METHOD FOR MAKING A SWITCH

Tetsuo Takeuchi, Ohmiya, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 335,152, Dec. 28, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 560,260

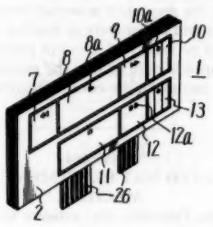
Claims priority, application Japan, Dec. 27, 1980, 55-186668

Int. Cl.³ B29C *17/00*; H01H *11/00*; B29F *1/10*

U.S. Cl. 29—622 **6 Claims**

1. In the method of producing a planar, push-type switching device by providing a front panel with a predetermined pattern projecting from one surface of the panel and having post-shaped parts, interposing a plurality of insulating sheets between a back-up plate and said front panel with said one surface confronting the adjacent one of said sheets and said post-shaped parts extending through respective openings in said sheets and back-up plate, and upsetting the ends of said post-shaped parts for assembling together said front panel, sheets and back-up plate; the improvement comprising providing said pattern projecting from said surface of the front panel by the steps of coating said surface of the front panel with a thermoplastic film;

disposing said surface coated with the thermoplastic film against a mold plate having a cavity in the form of said predetermined pattern opening toward said thermoplastic film and which includes a plurality of effective portions connected by relatively shallow runner portions with at least some of said effective portions being relatively deep and corresponding to said post-shaped parts of the pattern;



injecting material into said cavity through gates having restricted openings into said cavity only at regions of said relatively deep effective portions of the cavity corresponding to ends of said post-shaped parts so as to bond to said surface of the front panel through said thermoplastic film a molded body having said predetermined pattern; and

displacing said mold plate and said molded body away from each other to effect clean separation, at said ends of the post-shaped parts, of said molded body from solidified material remaining in said gates.

4,499,663

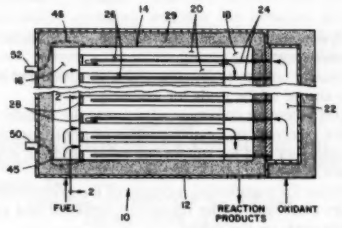
METHOD OF FABRICATING A MONOLITHIC CORE FOR A SOLID OXIDE FUEL CELL

Stanley A. Zwick, Woodridge, and John P. Ackerman, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1983, Ser. No. 541,184

Int. Cl.³ H01M *8/10*

U.S. Cl. 29—623.1 **19 Claims**



1. A method of making a fuel cell core for electrochemically combining fuel and oxidant for generation of galvanic output, the core having an array of electrolyte and interconnect walls, each electrolyte wall consisting of thin layers of cathode and anode materials respectively, sandwiching a thin layer of electrolyte material therebetween, each interconnect wall consisting of thin layers of the cathode and anode, respectively sandwiching a thin layer of interconnect material therebetween, whereby separate sections of said electrolyte wall are arranged between separate sections of adjacent interconnect walls oper-

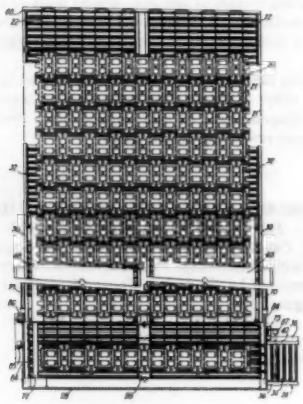
able to define a plurality of core passageways alternately arranged respectively where the inside faces thereof are formed either of only the anode material or of only the cathode material, each core passageway having the anode material on the inside being for the passage of fuel and each core passageway having the cathode material on the inside being for the passage of oxidant, the method being to build up the core electrolyte and interconnect walls simultaneously in a direction endwise of the walls and axially of the defined core passageways by applying the separate anode, cathode, electrolyte and interconnect materials onto itself as fine deposits or buildups according to the pattern of material as required in the core, the material applications for the respective materials being made separately and sequentially and repetitively to buildup the wall structure endwise of itself or axially of the core passageways, and heat curing the composite core to fuse the material layers and deposits together and make the core monolithic and dimensionally stable.

4,499,664

ARTICULATED MAT REVETMENT ASSEMBLY MACHINE

Michael J. Scales, Doraville, Ga., assignor to Nicolon Corporation, Norcross, Ga.

Filed Nov. 30, 1981, Ser. No. 325,677
Int. Cl.[3] B23P *21/00*; B23Q *15/00*
U.S. Cl. 29—714 **12 Claims**



9. A machine for assembling cables and grids into articulated revetment mats comprising:

a transfer conveyor for supporting the grids and positioning a course of the grids for assembly;

a grid receiving conveyor adjacent to the transfer conveyor for receiving successive courses of grids from the transfer conveyor and for supporting cables and the grids as they are assembled into a mat; and

a means for transferring a course of the grids from the transfer conveyor to the receiving conveyor and to advance the grids on the cables.

4,499,665

COURSE CORRECTION CALCULATOR

Randall C. Davis, 115 N. Lawson Rd., Poquoson, Va. 23662

Filed Jan. 27, 1983, Ser. No. 449,605
Int. Cl.[3] G01C *21/20*
U.S. Cl. 33—1 SB **5 Claims**

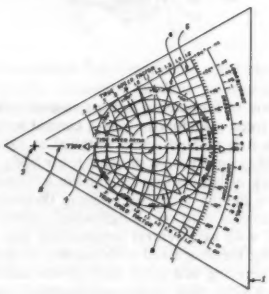
1. A course correction calculator for calculating a craft heading correction to account for craft drift due to movement with respect to the ground of a fluid medium in which said craft is moving, said fluid medium having a speed and direction of movement over the ground, said course correction calculator comprising:

an at least partially transparent substrate;

first means, associated with said substrate, for pivotally orienting said substrate with respect to a first point;

second means, associated with said substrate, for pivotally orienting said substrate with respect to a second point, wherein said first means and said second means are separated by a first line segment of a length representative of a ratio of fluid medium speed to craft speed of 1.00;

first arc segment means, associated with said substrate and having a center of curvature coincident with said first orienting means, for indicating varying ratios of fluid medium speed to craft speed where a fluid medium speed to craft speed ratio of 1.00 is indicated by a distance equal to said first line segment length;



second arc segment means, associated with said substrate and having a center of curvature coincident with said second orienting means, for indicating varying ratios of craft speed over the ground to craft speed in said fluid medium where a craft speed over the ground to craft speed in said fluid medium ratio of 1.00 is indicated by a distance equal to said first line segment length;

first angular scale means for indicating an angular relationship between said first line segment and a line between said first orienting means and a point not located on said first line segment; and

second angular scale means for indicating an angular relationship between said first line segment and a line between said second orienting means and a point not located on said first line segment.

4,499,666

UNIVERSAL FRAMING LAYOUT TOOL

Kenneth M. Smith, 1621 Belgrade Dr., Plano, Tex. 75023

Filed Jul. 6, 1982, Ser. No. 395,787
Int. Cl.[3] G01B *3/04*
U.S. Cl. 33—174 B **8 Claims**

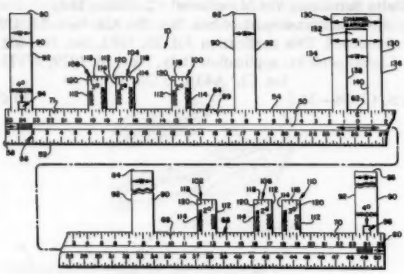
1. A framing layout tool for use in laying out the location of framing elements along a base plate and overhead plate from achitectural plan drawings for a building, comprising:

a planar, rectangular-shaped main bar having a straight edge as a first elongated side of said bar;

at least one pair of window and door marking guides extending from and coplanar with a second elongated side, said pair of window and door marking guides being spaced equidistantly from the centerpoint of said main bar a predetermined distance for marking window and door locations, said marking guides having a first straight marking edge normal to said bar for marking a window and a second straight marking edge normal to said bar for marking a door location;

at least one pair of elongated stud marking guides extending normal from and coplanar with said second elongated side

of said main bar, said pair of stud marking guides being spaced a predetermined distance apart for marking stud locations; and



a channel marking guide extending normal from said second elongated side, said channel marking guide being rectangular and having a predetermined width and further including a central rectangular opening of a predetermined width corresponding to the width of a stud.

4,499,667

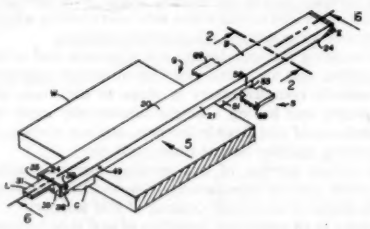
GUIDE CLAMP

Norman Griset, 380 Jennifer La., Orange, Calif. 92669

Continuation-in-part of Ser. No. 326,840, Dec. 3, 1981, Pat. No. 4,394,800. This application Jul. 19, 1983, Ser. No. 515,174

Int. Cl.³ A47B *27/00*; B43C *5/00*

U.S. Cl. 33—446 **20 Claims**



1. A guide clamp comprising a bar adapted to be placed upon surface of a workpiece and a jaw means having an abutment depending from the bar with a jaw face to engage the edge of the workpiece and wherein:

(a) the bar is channel-shaped with a top surface and a leg depending from each side thereof to define a cavity between the legs and provide an open undersurface at the base of the legs;

(b) the jaw means includes a block shiftably mounted within the cavity with the abutment being extended therefrom through the open undersurface; and

(c) a holding means is associated with the block to hold the jaw means at a selected position on the bar as when the jaw face engages the edge of a workpiece, said holding means including a clamp means carried by said block and being adapted to engage the inner surface of the bar, within the channel cavity, and lock the jaw means to the bar responsive to pressure of the jaw face as against an edge of a workpiece.

4,499,668

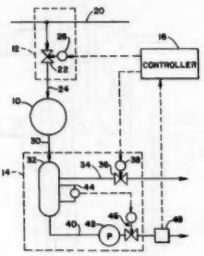
AUTOMATIC MINIMUM DIFFERENTIAL PRESSURE CONTROL FOR DRYER CYLINDERS

Alex Jumpeter, Lithonia, Ga., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 25, 1983, Ser. No. 554,936

Int. Cl.³ F26B *3/28*

U.S. Cl. 34—41 **9 Claims**



1. A method of minimizing a differential steam pressure across a drying cylinder without measuring steam flow rate, there being steam feed means for feeding steam to the drying cylinder at a controllable feed pressure, fluid removal means for removing condensate and steam from the drying cylinder at a controllable removal pressure, control means for controlling the steam feed means and fluid removal means to control the differential steam pressure across the drying cylinder, and condensate monitoring means for monitoring the quantity of removed condensate, the method comprising:

(a) monitoring a rate of change of removed condensate;

(b) determining whether the condensate removal rate is substantially constant;

(c) if the condensate removal rate is substantially constant, decreasing the pressure differential is preselected, differential pressure increments until a pressure which is insufficient to maintain the condensate removal rate constant is attained, and increasing the pressure differential substantially by one of the preselected pressure differential increments, whereby the pressure differential is decreased in the preselected incremental steps to the first incremental step which fails to maintain a constant condensate removal rate and then is increased to the preceding incremental step which is the lowest first incremental step that maintains the constant condensate removal rate; and,

(d) periodically checking whether the obtained pressure differential is just maintaining the condensate flow rate constant, whereby the steam pressure differential is minimized without measuring steam flow rates.

4,499,669

COMBINATION DRYER AND SURGE BIN

Paul J. Haeck, Indianapolis, Ind., assignor to Miller Hofft, Inc., Indianapolis, Ind.

Filed Sep. 30, 1982, Ser. No. 430,940

Int. Cl.³ F26B *17/20*

U.S. Cl. 34—102 **12 Claims**

1. A combination surge and drying apparatus for use in handling a bulk material, which comprises:

first and second bins, said second bin being located above said first bin;

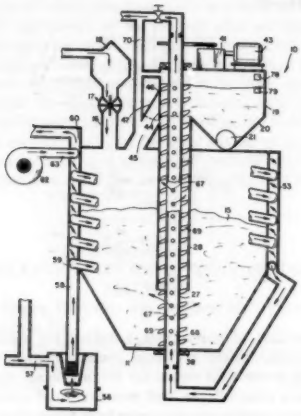
heat transfer means, surrounding at least a portion of said bin, for providing heat transfer from a hot fluid within said heat transfer means to the material received within said first bin;

discharge means for receiving and discharging material from within said first bin into said second bin;

gas introduction means for directing a drying gas into the

material within sid first bin prior to discharge of the material from said first bin;

overflow means for returning excess material in said second bin to said first bin, said overflow means including a passageway communicating between said first bin and said second bin separately from said discharge means; and



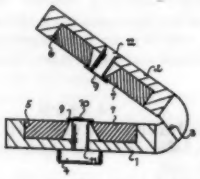
control means for controlling the passage of material through said overflow means, whereby material is selectively maintained within said second bin or is allowed to pass through said overflow means back to said lower, first bin.

4,499,670

DEVICE FOR HANDLING THIN SECTIONS, IN PARTICULAR CRYOSECTIONS, AND PROCESS FOR FREEZE-DRYING THIN SECTIONS

Kare E. Tvedt, Trondheim; Guennar Kopstad, Tiller, and Olav A. Haugen, Trondheim, all of Norway, assignors to C. Reichert Optische Werke, AG, Vienna, Austria

Filed Jun. 13, 1983, Ser. No. 504,011
Int. Cl.³ F26B *9/04*; B30B *7/00*
U.S. Cl. 34—143 **7 Claims**



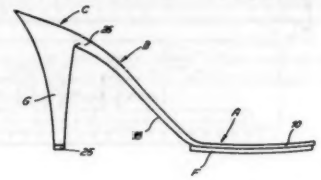
1. A device for handling thin sections, having a carrier grid for receiving a thin section, and a holder for the carrier grid, said holder comprising a baseplate, a holder-plate detachably located in a recess in said baseplate, said carrier grid being fastened above an opening which extends through said holder-plate, a pressure element located in the recess in said baseplate, said pressure element projecting into said opening into contact with the undersurface of the carrier grid, a guided cover plate which can be moved onto said baseplate, and means for clamping the cover plate against the baseplate and hence against a thin section which is present on the carrier grid.

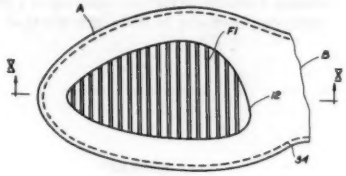
4,499,671

SHOE BOTTOM FOR GENERAL FOOTWEAR INCLUDING HEEL, INSTEP, PLANTAR, SUPPORT AND INSOLE

Giulio Sottolana, Via Mascheroni 15, Milan, Italy

Continuation-in-part of Ser. No. 206,226, Nov. 12, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,172
Claims priority, application Italy, Nov. 16, 1979, 27373 A/79
Int. Cl.³ A43B *13/28, 13/36*
U.S. Cl. 36—24.5 **10 Claims**





1. A shoe bottom unit comprising:

a shoe bottom made of a single piece of material, said shoe bottom having an upper side, a lower side, a rear part for supporting a heel, a flexible forepart and a stiff waist part joining together said forepart and said rear part

said forepart having an opening going therethrough from said upper side to said lower side, said opening adapted to receive a top portion of a wearing member;

said wearing member having a top portion and a bottom portion, said top portion having an outside contour substantially complementary in shape to the shape of said opening and having a height substantially equal to the thickness of said flexible forepart, said top portion of the wearing member having transversal ribs;

said bottom portion of said wearing member having an outside contour substantially complementary in shape to the shape of an outside contour of said forepart;

whereby in an assembled condition of said shoe bottom unit said wearing member is fixedly attached to said flexible forepart in such manner that the entire lower side of said forepart is covered by said wearing member and whereby said wearing member having said transversal ribs on the top portion thereof and said forepart define one flexible unit.

4,499,672

SHOES SOLE FOR VENTILATION AND SHOCK ABSORPTION

Sang Do Kim, 433-63, Youl Jun-Dong, Su Won-Clty, Kyung Ki-Do, Rep. of Korea

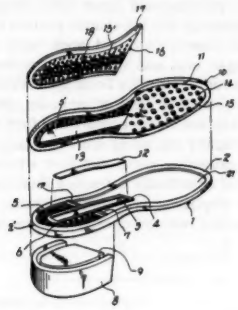
Filed Dec. 20, 1982, Ser. No. 451,427
Int. Cl.³ A43B *7/06, 13/20*
U.S. Cl. 36—3 B **5 Claims**

1. A shoe sole comprising:

an outersole having an upper surface and lower surface forming a forward portion and a heel portion and having at least one ventilating hole extending between said upper and lower surface in said heel portion and at least one

waterproof key having portions projecting from said upper and lower surface between said heel and forward portions; and

a heel coupled to the lower surface of said heel portion of said outersole having a channel extending through said heel which communicates with said at least one ventilating hole, said channel having at least one portion which opens external to said heel and being positioned such that one portion of said at least one waterproof key projects into said at least one portion to close said channel from opening external to said heel in response to weight on said heel portion.

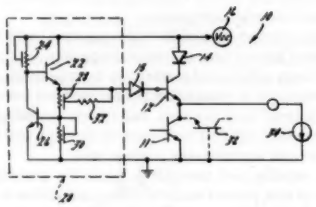


4,499,673

REVERSE VOLTAGE CLAMP CIRCUIT

William G. Garrett, Canton, and Karl W. Overberg, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 7, 1983, Ser. No. 472,502
Int. Cl.³ H02H 9/04
U.S. Cl. 361—56 **10 Claims**



1. A reverse voltage clamp circuit for preventing the collector voltage of an output transistor from substantially crossing a voltage reference near ground potential, said reverse voltage clamp circuit being adapted to be coupled to a voltage source and including:

a first clamping transistor having an emitter coupled to the collector of said output transistor; ;p1 a first diode coupled to the base of said clamping transistor; and

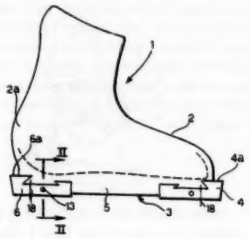
a reference voltage means coupled to the voltage source and to said first diode for establishing a reference voltage at the input to said first diode so as to keep the collector potential of said output transistor from substantially crossing the voltage reference near ground potential.

4,499,674

SKI BOOT WITH A DEVICE FOR REGISTERING ITS AXIAL ORIENTATION IN REGARD TO THE SKI

Icaro Olivieri, Montebelluna, Italy, assignor to Icaro Olivieri & C. S.p.A., Montebelluna, Italy

Filed Jul. 19, 1982, Ser. No. 399,248
Claims priority, application Italy, Jul. 20, 1981, 23023 A/81
Int. Cl.³ A43B 5/04; A63C 9/00
U.S. Cl. 36—117 **6 Claims**



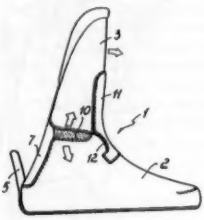
1. A ski boot comprising a body, a sole, and means for allowing said body to move in a direction transverse to the longitudinal axis of the sole, in such a way that the movement may be registered, wherein said sole includes a tip section and prismatic connection means, said tip section being independent of the rest of the sole and of the body of the boot, a corresponding tip section of said body being connected along a sliding path with said tip section of the sole through said prismatic connection means extending in a transverse direction in relation to the sole, and further comprising means for detachably locking said body to said tip section of said sole.

4,499,675

SKI BOOT INNER SHOE

Riccardo Perotto, Volpago, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Jan. 17, 1983, Ser. No. 458,677
Claims priority, application Italy, Jan. 22, 1982, 20612/82[U]
Int. Cl.³ A43B 5/04
U.S. Cl. 36—119 **6 Claims**



1. A ski boot inner shoe comprising:

a lower portion enclosing skier's foot

an upper portion connected to said lower portion and spanning skier's leg front

at least one flexible section arranged in a connection area between said lower portion and said upper portion

said flexible section allowing flexure between said upper portion and said lower portion.

4,499,676

SKI BOOT

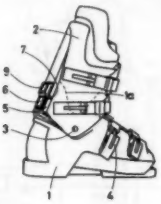
Edward L. Chalmers, II, Boulder, Colo., assignor to Lange International S.A., Fribourg, Switzerland

Filed Dec. 2, 1982, Ser. No. 446,371

Claims priority, application Switzerland, Feb. 18, 1982, 1018/82

Int. Cl.³ A43B *5/04, 5/16*

U.S. Cl. 36—120 **8 Claims**



1. A ski boot comprising a boot lower, a boot upper pivotally mounted on the boot lower, a rocker pivotally mounted in a recess in the rear of the boot upper and adapted to be rotated between two positions, spring means urging rotation of said rocker on its pivot to the first of the two positions, a stop provided on the boot lower for engaging the rocker when it has been rotated to its first position, the rocker and stop cooperating to lock the boot upper against rearward movement of the boot lower when the boot upper is pivoted to a forward position, the rocker adapted to be manually urged against action of the spring means to the second position at which the stop is disengaged from the rocker, thereby unlocking the boot upper and permitting it to pivot rearwardly on the boot lower to facilitate standing and walking with the boot, and the rocker automatically being rotated to its first position by the spring means when the boot upper is pivoted forwardly in preparation for skiing to lock the boot upper in said forward position.

4,499,677

MACHINE FOR IRONING COLLARS AND CUFFS

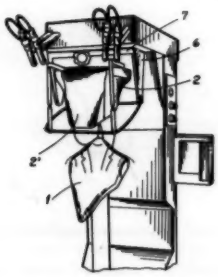
Giovanni Cartabbia, Palazzolo Sull'Oglio, Italy, assignor to Bordogna O. & C., Macpi S.p.A., Palazzolo Sull'Oglio, Italy

Filed Dec. 2, 1982, Ser. No. 446,361

Claims priority, application Italy, Dec. 21, 1981, 25723 A/81

Int. Cl.³ D06F *71/22*

U.S. Cl. 38—28 **3 Claims**



1. A machine for ironing collars and lapels on articles of clothing, comprising a fixed dummy having a configuration substantially corresponding to the configuration of a part of the upper portion of a human body for fitting an article of clothing having a collar and lapels, an upper mold having a lug-shaped downwardly extending portion and a configuration for substantially matching said dummy on a top and a front portion thereof, a support means for pivotally supporting said upper mold about a horizontal axis substantially parallel to said front portion, means for vertically displacing said support means between a rest position in which said upper mold is spaced from said dummy and an operative position in which said upper mold contacts said top portion of said dummy and is pressed against said top portion onto said collar, and means for selectively pivoting said upper mold about said horizontal axis and for pressing said lug-shaped portion against said front portion of said dummy onto said lapels when said upper mold as been brought into said operative position, wherein said upper mold is supported by a horizontal support plate having downwardly extending arms at opposite ends thereof, and wherein said support means comprises a fork structure having respective vertically extending arms pivotally supporting said downwardly extending arms, said fork structure being rigid with a piston of a vertically extending fluid-operated cylinder for vertically displacing said support means and said upper mold between said rest and operative positions.

4,499,678

MECHANICAL DEVICE FOR CONCEALING OR DISPLAYING PRINTED MATTER

Claude Moreau, 8506 60th Ave., Elmhurst, N.Y. 11373

Filed Jun. 20, 1983, Ser. No. 505,825

Int. Cl.³ A44C *3/00*

U.S. Cl. 40—1.6 **9 Claims**

1. A mechanical device for selectively concealing or displaying printed material comprising:

first and second separable body portions, said first body portion having first and second openings;

a ribbon on which said material to be selectively concealed or displayed is printed and connected between said first and second body portions, said ribbon extending outward from inside said first body portion through said first opening to said second body portion; and

ribbon winding and unwinding means for enabling the display of said printed material when said ribbon is unwound and for enabling said printed material to be concealed when said ribbon is wound, said ribbon winding and unwinding means comprising:

a rotatable reel on said first body portion and having first and second winding zones, said ribbon being connected at one end thereof to said reel and being windable from said first winding zone of said reel, and

means extending outward from said first body portion through said second opening and windable onto and unwindable from said second winding zone of said reel for causing said ribbon to wind onto said reel when said means is being unwound from said reel, and said means being wound onto said reel when said ribbon is being unwound from said reel.

4,499,679

ANTI-THEFT FRAME HANGING SYSTEM

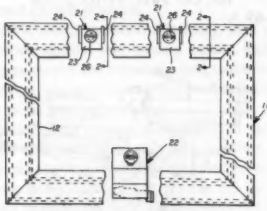
Charles F. Sherman, Townsend, Mass., assignor to Nielsen Moulding Design Corporation, Townsend, Mass.

Filed Apr. 13, 1983, Ser. No. 484,493

The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.

Int. Cl.³ F16M *13/00*

U.S. Cl. 40—152.1 **18 Claims**



1. A frame apparatus comprising:

a frame body adapted to retain a display article and having a rear surface for attachment to a support surface, the perimeter of said rear surface defined by rearwardly facing channels terminated with inwardly extending lips;

releaseable latch means for attaching said rear surface to the support surface and movable between a locked position preventing removal of said frame body from the support surface and a release position allowing removal thereof, said latch means comprising release means disposed between and substantially concealed by said frame body and the support surface and operable to move said latch means into said release position to allow removal of said frame body; and

a plurality of spaced apart catch bracket means for mounting on the support surface; each said catch bracket means comprising a base portion projecting away from the support surface, a hook portion extending substantially parallel to the support surface and engaged by one of said lips, and bracket securing means comprising one portion engaging said base portion and another portion engaging the support surface, and wherein said base portions, said hook portions and said one portions of said securing means are substantially completely retained by said channels.

4,499,680

IDENTIFICATION BAND

James A. Coburn, 2 Coburn La., Whitewater, Wis. 53190

Continuation of Ser. No. 344,184, Jan. 29, 1982,. This application May 21, 1984, Ser. No. 612,251

Int. Cl.³ G09F *3/00*

U.S. Cl. 40—304 **3 Claims**

1. An identification band device formed of a suitable flexible material and having a width adapted to receive identifying indicia and a length adapted to permit looping of the band about an object, comprising an elongated band including a flexible strap having a longitudinally extended connecting portion and an interconnected flexible buckle secured to the strap in spaced relation to said connecting portion, said buckle having a bottom wall essentially coplanar with said strap and a pair of side walls spaced laterally of the buckle and the strap to define a lateral opening to the top side of the strap at least as wide as the width of the outer end of the strap, said buckle including an upper wall integrally connected to said side walls and adapted to define an opening of a depth less than the thickness of the connecting portion of the said strap, said bottom wall of said buckle including a plurality of teeth extending longitudinally of the buckle, said strap having a plurality of similar teeth on the underside of the strap and adapted to mate with said buckle teeth and having a top side which is essentially a smooth, flat surface, a centrally located ridge integrally formed on the interior of said upper wall and of a width substantially less than the width of said buckle teeth, said ridge projecting inwardly within the buckle toward said buckle teeth to define said opening having a depth less than the thickness of the connecting strap portion, and said ridge engaging said smooth, flat surface of the strap with the strap connecting portion in said buckle to hold said teeth of said strap in firm interengagement with the bottom wall teeth of said buckle.

4,499,681

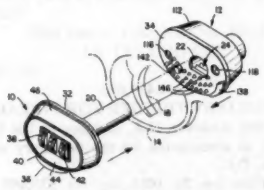
SECURITY DEVICE FOR FIREARMS

Lazlo Bako, Woodcliff Lake, and Stephen S. Scelba, Clifton, both of N.J., assignors to Presto Lock, Inc., Garfield, N.J.

Filed Mar. 7, 1983, Ser. No. 472,766

Int. Cl.³ F41C *27/10*

U.S. Cl. 42—1 Y **19 Claims**



1. A security device for preventing unauthorized use of a firearm, the device comprising a pair of covers adapted to be disposed on opposite sides of a firearm trigger guard, respectively, a latch member associated with one of the covers, the latch member having an elongate latching portion protruding from said one cover, and the other cover being formed with an opening in which is disposed a catch member adapted to engage and retain the latching portion when the covers are pressed together with the trigger guard therebetween and with the latching portion being projected longitudinally through the trigger guard into said opening, the covers when mutually engaged being adapted to embrace the trigger guard and prevent operation of the trigger, wherein the latching portion is supported for translational movement transversely of its length between latching and unlatching positions with respect to the catch member, and said one cover has a manual actuator for moving the latch member from the latching to the unlatching position and a lock with exposed operating means for preventing movement of the latch member from the latching position to the unlatching position except when the operating means is set to open the lock.

4,499,682

FISHING LURE

Lester M. Davis, deceased, late of Gig Harbor, Wash., and Ruth L. Davis, executrix, 10805-36th St. NW., Gig Harbor, Wash. 98335

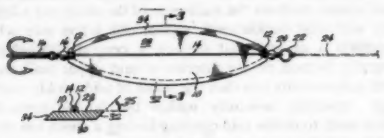
Filed Sep. 20, 1982, Ser. No. 420,036

Int. Cl.³ A01K *85/00*

U.S. Cl. 43—42.19 **7 Claims**

1. A fishing lure tending to turn on its longitudinal axis when not under tension from its connecting fishing line comprising a heavier-than-water body portion having a length a plurality of times greater than its width and having two parallel, spaced

apart, side face portions and two spaced apart end surface portions, said side face portions being a plurality of times greater than the end surface portions, each side face portion forming spaced apart acute and obtuse angles with the spaced



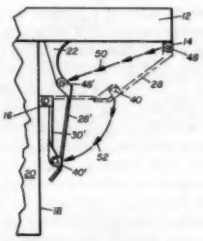
apart end surface portions, the obtuse angles being disposed alternately during turning of the lure about its longitudinal axis; and bearing means carried by the body portion for rotatively mounting the body relatively to a fishing line.

4,499,683

AUXILIARY TRIGGER FOR FIREARM

Giulio V. Savioli, Andover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 26, 1983, Ser. No. 535,499
Int. Cl.³ F41C *19/00*
U.S. Cl. 42—69 R **4 Claims**



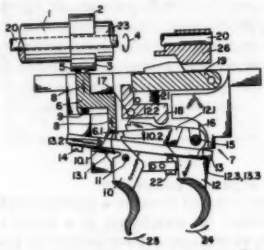
1. An auxiliary trigger for a firearm which comprises:
a biased trigger having a trigger pin hole in one end thereof;
a first holed pivot support member operatively positioned on a lower side of the muzzle end of said firearm;
a second holed pivot support member operatively disposed and fixedly attached to an inside surface of the handle of said firearm;
convertible trigger guard means detachably connected to said first holed pivot support member by removeable pin means on a front end and hingedly connected to said second holed pivot support member, said guard means acting as a conventional trigger guard to prevent accidental firing then said front end is pin connected to said first support member, and for acting as an auxiliary extended trigger for gloved operation when said trigger guard front end is pivotally connected to said end of said biased trigger by means of insertion of a pin through said trigger pin hole.

4,499,684

TRIGGER MECHANISM

Otto Repa, Oberndorf, Fed. Rep. of Germany, assignor to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 302,467, Sep. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 53,803, Jul. 2, 1979, abandoned. This application Mar. 7, 1984, Ser. No. 587,186
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 7820914[U]
Int. Cl.³ F41C *19/02, 17/08*
U.S. Cl. 42—69 A **4 Claims**



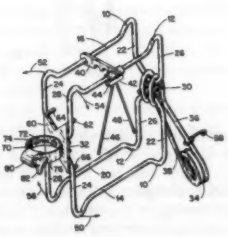
1. In a firearm, particularly a sporting gun of the type having a rotatable bolt and a trigger mechanism accomodated in a trigger housing, a first trigger pivotally mounted to the housing, a hair trigger engaged with said first trigger in a cocked position of the trigger mechanism, and means for mechanically releasing the first trigger from engagement with the hair trigger, the combination comprising:
a locking projection on the bolt;
a reset member mounted in the trigger housing for linear motion;
said locking projection being engagable with said reset member during the rotary motion of the bolt to actuate the linear motion of the reset member in one direction; and
the first trigger being pivotally mounted on a pivot axis for pivoting movement responsive to the motion of the reset member in said one direction, thereby releasing the hair trigger from engagement with the first trigger.

4,499,685

SUPPORT MEANS FOR A ROTATING FRAME ANIMAL BODY TRAP

James N. Sibley, Taylor Ford La., Rte. 28, Knoxville, Tenn. 37920

Filed Aug. 16, 1982, Ser. No. 408,467
Int. Cl.³ A01M *23/26*
U.S. Cl. 43—96 **6 Claims**



1. In combination, a single spring rotating frame trap with a stabilizing clamp comprising:
a rotating frame animal trap including;

pivotally mounted jaws formed of a pair of frames, each one of said pair having two parallel side members and two parallel jaw members substantially perpendicular to said side members, said pair of frames being pivotally mounted with respect to each other at a first and further pivot point located at each of said side members such that said parallel jaws of one of said frames rotates to a closed position proximate said parallel jaws of said other frame;

means adjacent said first pivot point for biasing said jaws in said closed position,

releasable catch means for holding said jaws in an open position against said biasing means, and

a trigger means for releasing said catch means; and

a stabilizing support clamp located adjacent said further pivot point and comprising,

a support plate pivotally mounted at said further pivot point and parallel to said side member,

clamp means non-rotatably attached to said support plate away from said rotating frames for gripping a support stake to maintain said trap in a selected location prior to the firing of said trap and maintain said trap secured to said stake subsequent to said trap fixing,

at least three extensions fixedly mounted to said support plate and extending in a manner for contacting said side members of said pair of frames to prevent rotation of said frames with respect to said support stake when said frame is held in said open position, while at the same time allowing said frames to rotate with respect to each other to said closed position when said release catch is triggered.

4,499,686

PLANT WATERING DEVICE

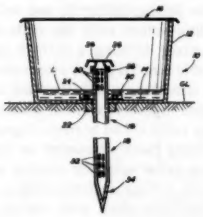
Edgar P. Scragg, Florida, South Africa, assignor to Prima Valves International (Proprietary) Limited, Bedfordview, South Africa

Filed Jul. 29, 1982, Ser. No. 403,268

Claims priority, application South Africa, Aug. 5, 1981, 81/5382

Int. Cl.³ A01G *29/00*

U.S. Cl. 47—48.5 **1 Claim**



1. A plant watering device comprising a receptacle for containing water and an outlet tube the interior of which communicates with the interior of said receptacle and which extends downwardly to below a base wall of said receptacle, said tube being open at the lower end thereof and there being a hollow cover of pointed shape secured to the lower end portion of the tube, the cover extending above and below the lower end of the tube and there being a gap between the tube and that part of the cover which is above said lower end of the tube, the space within the tube being packed with a medium through which, in use, water contained in said receptacle percolates before emerging from said tube through said gap which forms a water flow path from the lower end of the tube to an outlet between the upper end of said cover and the tube.

4,499,687

HYBRID BRASSICA SEED PRODUCTION

Robert H. Lawrence, Jr., Boulder, Colo., and Phillip E. Hill, Gilroy, Calif., assignors to Agrigenetics Research Associates Limited, Boulder, Colo.

Continuation-in-part of Ser. No. 435,333, Oct. 19, 1982, abandoned, which is a continuation of Ser. No. 169,874, Jul. 17, 1980, abandoned. This application Jan. 31, 1983, Ser. No. 462,416

Int. Cl.³ A01G *1/00*

U.S. Cl. 47—58 **9 Claims**

1. A process for the production of high purity hybrid Brassica seed, comprising:

(a) selecting a heterozygous maximally self-incompatible parent plant;

(b) cloning said selected heterozygous maximally self-incompatible parent plant to produce a first cloned parental line, the plants of which are both maximally self-incompatible and maximally clonal-incompatible;

(c) crossing plants of said first cloned parental line with plants of a second parental line; and

(d) collecting high purity hybrid seed from said first cloned parental line.

4,499,688

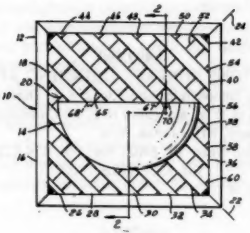
WALL HANGING

Frances Droll, 7930 E. Camelback Rd., Apt. #108, Scottsdale, Ariz. 85251

Filed Jan. 4, 1982, Ser. No. 336,517

Int. Cl.³ A01G *9/02*

U.S. Cl. 47—83 **3 Claims**



1. A wall hanging comprising a square lattice specifically adapted to be secured to a wall and to support a planter secured thereto including a plurality of separate groups of linear lattice members extending at 90° to each other in spaced apart relation a distance not greater than half the dimension of the planter in the same directions and substantially equal to the width of the linear lattice members in the same direction and parallel to the diagonals of the square lattice, said planter including separate spaced apart means cooperative with the square lattice member for securing the planter to the square lattice member with the planter in different relative angular positions with respect to the square lattice member oriented at 45° with respect to each other which spaced apart means for securing the planter to the square lattice includes at least two spaced apart separate right angle hooks on the planter which hooks are separated by a dimension in the plane of the lattice approximately three quarters of the dimension of the edge of the square lattice in the plane of the lattice and include portions extending through the front of the lattice mounted on a wall and down behind the lattice through separate openings in the lattice with the lattice and planter in either of two angularly related positions with the hook portions extending over the individual members of the lattice and which hooks have a triangular cross section complimentary to the angle formed by the intersection of adjacent linear lattice members with the sides of the square lattice parallel and perpendicular to a horizontal plane and which hooks are spaced apart horizontally

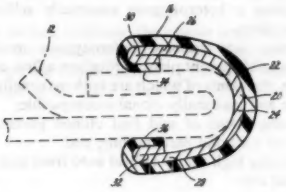
with the planter positioned on a wall with the sides of the lattice parallel and perpendicular to the horizontal a dimension exactly equal to the distance between next adjacent openings in the lattice.

4,499,689

DOOR EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Sep. 19, 1983, Ser. No. 533,690
Int. Cl.³ E05F 7/00
U.S. Cl. 49—462 **3 Claims**



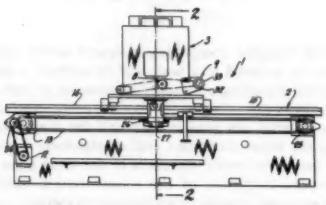
1. A self-retaining insulated metal edge guard comprising a metallic channel having a U-shaped cross section, a non-metallic covering extending around the exterior of the U-shaped cross section, inwardly turned beads at the ends of the U-shaped cross section, said covering extending around said beads so as to cover the inwardly facing surfaces of said beads, and in which the material of said metal is 5052 H-33 aluminum, said metallic channel adapted to apply the self-retention force via said beads through said covering on the inwardly facing surfaces of said beads.

4,499,690

SPLIT STATIONS SURFACE GRINDING APPARATUS

Donald A. Kilb, Brookfield, and Richard A. Diereksmeier, Milwaukee, both of Wis., assignors to E. D. Coddington Manufacturing Company, Milwaukee, Wis.

Filed Mar. 10, 1983, Ser. No. 474,021
Int. Cl.³ B24B 7/02
U.S. Cl. 51—56 R **15 Claims**



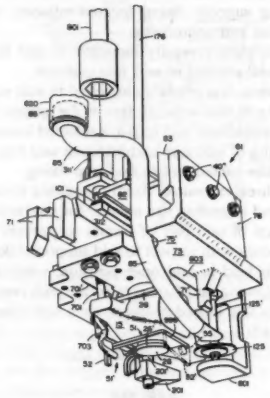
1. A grinding machine, comprising an elongated supporting bed and including first and second work stationary holder means for holding of work parts, said holder means being mounted in longitudinal alignment to opposite sides of an intermediate location of the bed and arranged to define a single elongated work support, a grinding head assembly having a carriage means movably mounted to traverse the entire length of both said holder means and having an annular grinding wheel with an end grinding face, sensing means coupled to the head assembly to monitor the movement to the opposite ends of each holder means, vertical sensing means coupled to the head assembly to monitor the vertical position of the grinding wheel, drive means for vertically positioning of said grinding wheel, and logic control means for selectively actuating said head assembly in a mode in which the carriage means alternately and cyclically reciprocates over the first work holder means in a plurality of passes and then over the second work holder means in a plurality of passes in response to enabling the corresponding first and second holder means and having means to reposition said grinding wheel in said successive passes.

4,499,691

JET PUMP BEAM BOLT RETAINER CUTTER

Michael P. Karazim; Bob Y. Okashima, both of San Jose, and John J. Ashburn, Livermore, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 25, 1982, Ser. No. 411,307
Int. Cl.³ B24B 19/00
U.S. Cl. 51—241 S **26 Claims**



1. A cutting apparatus for mounting onto a jet pump assembly in a nuclear reactor system including a transition piece and an inlet mixer, said transition piece effective for receiving water from an inlet riser and for routing at least a portion of said water to a single inlet mixer of said jet pump assembly, said inlet mixer being effective for engaging a jet pump beam including trunions and a beam bolt defining a laterally flanged lower circumference effective for securing said inlet mixer, said transition piece including arms joined at their upper ends by beam means for joining said arms and defining notches for engaging in holding action with the ends of said jet pump beam, said inlet mixer defining a surface against which the beam bolt is bearable near its lower circumference and including vertical sides straddlingly adjacent said surface, said inlet mixer being coupled together at initial assembly with a retaining piece including vertical and horizontal portions, one of said vertical portions being fixedly mounted on one of said vertical sides and including other arms for holding engagement with said beam bolt, said cutting apparatus being seatable on said inlet mixer and transition piece with said jet pump beam rotated 90 degrees out of normal installed position to permit cutting operation, said cutting apparatus comprising a baseplate including mounting extensions for respectively being supported upon said inlet mixer and by the arms of said transition piece, further comprising a first latch means mounted on said baseplate for securing said cutting apparatus onto said jet pump beam and said retaining piece, and horizontal means for horizontally translating on said baseplate, said horizontal means including cutting means for cutting including wheel means for cutting through said retaining piece along a horizontal line, and vertical means for positioning said cutting means vertically at said horizontal line, said horizontal means being effective for horizontally translating said wheel means along said horizontal line for cutting through said retaining piece, whereby the portion of said retaining piece being fixedly

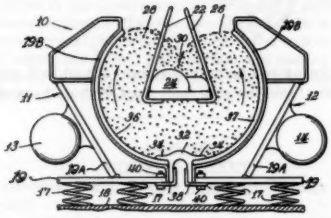
mounted onto said transition piece is separated from the remainder thereof.

4,499,692

DUAL MOTION VIBRATORY FINISHING MACHINE AND METHOD

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Filed Jun. 16, 1982, Ser. No. 389,005
Int. Cl.³ B24B 1/00
U.S. Cl. 51—313 33 Claims



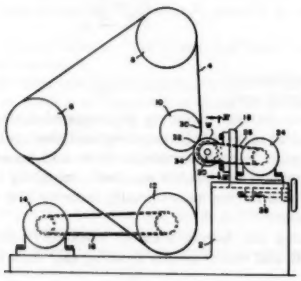
1. A method for the surface finishing of a part or workpiece with loose particulate finishing material or media comprising the steps of providing a first body of finishing media, providing a second body of finishing media, said first body and said second body being in side-by-side or lateral juxtaposition with respect to each other, independently applying vibratory action to each of said first and second bodies of finishing media to impart relative motion thereto and to cause portions of said first and second bodies to impinge upon each other, and subjecting the part or workpiece to said finishing media for the surface finishing of said part or workpiece by the action of said finishing media.

4,499,693

METHOD OF GRINDING NON-UNIFORM WORKPIECES

James J. Fatula, Sr., Ellwood City, Pa., and Martin J. Carroll, Sun City Center, Fla., assignors to Ryman Engineering Company, Ellwood City, Pa.

Filed Sep. 15, 1982, Ser. No. 418,440
Int. Cl.³ E05D 17/00
U.S. Cl. 51—322 6 Claims



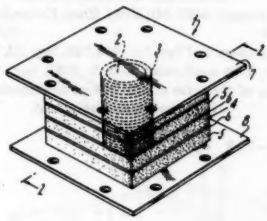
1. A method of grinding a non-uniform workpiece to substantially remove its non-uniformity by means of an endless abrasive belt which comprises rotating the workpiece about a longitudinal axis, passing the inside of said belt in contact with a belt contact surface at a tangent point, moving said workpiece against the outside of said belt substantially at said tangent point on said contact surface and holding it in positive contact with said belt, wrapping said belt around an arc of said workpiece in firm contact therewith a distance sufficient to heat the workpiece substantially uniformly, and moving said belt continuously to grind said substantially uniformly heated workpiece.

4,499,694

CYCLIC SHEAR ENERGY ABSORBER

Ian G. Buckle, and Steven M. Built, both of Auckland, New Zealand, assignors to Development Finance Corporation of New Zealand, Wellington, New Zealand

Filed Jun. 16, 1983, Ser. No. 504,725
Claims priority, application New Zealand, Jun. 18, 1982, 201015
Int. Cl.³ E04B 1/98
U.S. Cl. 52—167 21 Claims



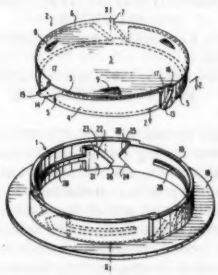
1. In a cyclic shear energy absorber adapted to be interposed between two members for absorbing energy due to induced motion between said two members, said energy absorber including a first end portion engageable to one of said two members, a second end portion engageable to the other one of said two members, and plastically cyclically deformable energy absorber means extending between said first and second end portions, the improvement comprising restraining means disposed about said energy absorber means in the region between said first and second portions, said restraining means having a flexible wall surface for confining said energy absorber means during induced motion between said two members while permitting said energy absorber means to deform.

4,499,695

MANHOLE

Jacques Oger, Pont-à-Mousson; Jean-Claude Hauer, Saulxures lès Nancy, and Jean-Louis Freis, Saint Nicolas de Port, all of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Mar. 11, 1982, Ser. No. 357,122
Claims priority, application France, Mar. 18, 1981, 81 05400
Int. Cl.³ E02D 29/14
U.S. Cl. 52—19 6 Claims



1. A manhole cover assembly of the type comprising a frame intended to be sealed in a highway covering and a removable

cover or plug engaging said frame, said plug comprising on its periphery facing said frame three helical ribs in the shape of screw threads and said frame comprising on its periphery facing said plug three helical grooves, said grooves receiving said ribs, and wherein each rib (5A) in transverse cross-section is comprised of two lateral rounded parts (11A, 12A) and wherein the corresponding grooves in cross-section have corresponding parts (23A, 24A) for engagement with said lateral rounded rib parts (11A, 12A), of concave shape with a radius of curvature (R) greater than the radius of curvature (r) of said rib lateral parts (11A, 12A), and wherein the area of the transverse cross-section of the ribs (5A) decreases from top to bottom.

4,499,696

DWELLING STRUCTURE

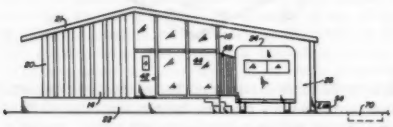
Robert F. Freeauf, 4487 Mt. Troy Road Extension, Pittsburgh, Pa. 15214

Continuation-in-part of Ser. No. 944,788, Sep. 22, 1978, Pat. No. 4,250,669. This application Feb. 9, 1981, Ser. No. 232,995

The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.

Int. Cl.³ E04H *1/12*

U.S. Cl. 52—79.8 **10 Claims**



1. A dwelling adapted to releasably receive a portable towable trailer housing unit adjacent thereto, said dwelling being devoid of plumbing and utilizing the bathroom and kitchen facilties of such portable trailer housing unit when the two are joined together, said dwelling comprising:

a general living area;

a sleeping area;

portal means for permitting egress and ingress to the dwelling;

means, positioned proximate one of said portal means, for joining the portable trailer housing unit to said dwelling for making connection between the two when the two are joined; and

means, stationarily mounted proximate said dwelling for engaging the tires of the portable trailer housing for facilitating the movement of the portable trailer toward and away from said dwelling.

4,499,697

SUSPENDED CEILING WITH REMOVABLE TEE SECTIONS

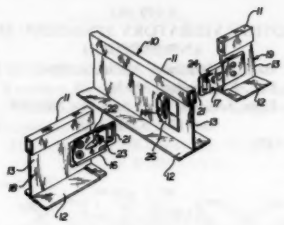
Paul D. LaLonde, Lorain, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Feb. 9, 1981, Ser. No. 232,584

Int. Cl.³ E04B *1/00, 5/52*

U.S. Cl. 52—98 **9 Claims**

1. A connector system for grid systems comprising a first elongated member having a substantially planar web formed with an opening therein, said web providing release means movable from a first position substantially in said plane of said web to a second position out of the plane of said web, said release means when in said first position defining at least part of said opening, a second elongated member having a first end connector operable to be inserted lengthwise into said opening while said release means is in said first position, and providing laterally extending deflectable first lock means which deflect during said insertion and interlock said members when inserted, said opening being of a size to allow the end connector to pass fully therethrough with said lock means deflected, movement of said release means to said second position enlarging said opening and permitting release of said lock means for withdrawal of said first end connector from said opening.



4,499,698

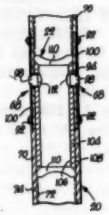
METHOD AND APPARATUS FOR ANCHORING RETAINING WALLS AND THE LIKE, AND INSTALLATION THEREFOR

Robert M. Hoyt; Donald E. Bobbitt; Gary E. Bartee; Stanley C. Garton, all of Centralia, and J. Paul Pilliard, Columbia, all of Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Jan. 31, 1983, Ser. No. 462,361

Int. Cl.³ E02D *5/74*

U.S. Cl. 52—157 **8 Claims**



1. In combination:

an elongated rod;

an anchor member including an elongated shaft and means affixed to said shaft for securing said shaft in the earth;

an elongated adapter separable from, and interconnecting said rod and said anchor member comprising

a first end having means fixedly securing said rod to said adapter;

a second end having a cavity releasably receiving said shaft, and means fixedly securing said shaft in said cavity,

a third section, polygonally-shaped in cross-section, intermediate said first and second ends,

a tubular wrench shank telescoped over said rod and said third section, said shank being of complemental polygonal cross-sectional shape and dimensions relative to said third section for a mating fit driving engagement with said third section, such that axial rotation of said shank effects corresponding axial rotation of said adapter and anchor member.

4,499,699

MOLDING DEVICE FOR SUB-SOIL CURTAIN WALL SECTIONS

Theodor Baumann, Ismaning, and Otmar Schreyegg, Geretsried, both of Fed. Rep. of Germany, assignors to Philipp Holzmann Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 30, 1983, Ser. No. 480,400

Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218516

Int. Cl.³ E04B *1/00*; E04G *21/00*

U.S. Cl. 52—169.1 **12 Claims**

1. Molding device for the fabrication of sub-oil curtain wall sections in the construction of the walls of sub-soil structures, characterized in that the moulding device is a precast concrete structural part which remains in the wall of the structure and which has at least one injection pipe passing vertically therethrough and provided with injection valves for injecting leakage points with sealing compound.

4,499,700

ROOFING SHEET

Erik Gustafsson, Luleå , Sweden, assignor to Plannja AB, Luleå , Sweden

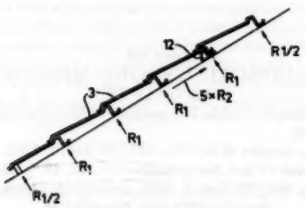
PCT No. PCT/SE81/00128, § 371 Date Dec. 7, 1981, § 102(e) Date Dec. 7, 1981, PCT Pub. No. WO81/03196, PCT Pub. Date Nov. 12, 1981

PCT Filed Apr. 27, 1981, Ser. No. 329,279

Claims priority, application Sweden, Apr. 28, 1980, 8003210

Int. Cl.³ E04B *7/02*; E04D *1/34*

U.S. Cl. 52—478 **2 Claims**



1. Roof construction comprising:

a plurality of spaced rafters;

and a plurality of self-supporting roofing sheets each comprising;

an upper edge which extends substantially horizontally parallel to the plane of the pitch of the roof when installed,

a lower edge extending substantially parallel to said upper edge,

a sheet portion between said upper and lower edges and integral therewith;

said upper edge having a substantially open cross-sectional shape to form a self-supporting beam integral with said sheet portion comprising,

a first flange portion fixedly attached to and spanning the spaces between a plurality of said rafters,

a second flange portion spaced upwardly from said first flange portion,

and a web portion between said flange portions extending at an angle to the plane of the pitch,

stiffening grooves in said sheet portion extending between said upper and lower edges, and

said lower edge having a shape to overlap said upper edge of an adjacent identical roofing sheet formed by a flange projecting downwardly from said sheet portion and a tongue extending outwardly from the lower edge of said flange substantially parallel to said sheet portion and grooves, so that when said lower edge overlaps said upper edge the lower surface of said tongue substantially conforms with and closely engages the upper surfaces of said sheet portion and grooves adjacent said upper edge;

so that said beams serve as the sole structural supporting members for the roof between said rafters and each roofing sheet is a one piece self-supporting roofing sheet in that said beam is in contact with the rafters and forms a part of the roof structure itself and no additional structural elements are required to support the beam or the sheet portion in a direction substantially perpendicular to the plane of the roof.

4,499,701

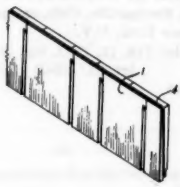
RABBETED SHINGLE BUTT JOINT SIDEWALL PANEL AND SHINGLE COMPONENT

Joe L. Bockwinkel, Winlock, and Willis G. Pehl, Chehalis, both of Wash., assignors to Shakertown Corporation, Winlock, Wash.

Division of Ser. No. 143,301, Apr. 24, 1980,. This application Sep. 15, 1981, Ser. No. 302,339

Int. Cl.³ E04D *1/00*

U.S. Cl. 52—555 **2 Claims**



1. In a sidewall shingle panel including a face layer of high quality random width wood shingles, having their lengths extending generally lengthwise of their grain, tapered in thickness from butt to tip and disposed in edge-abutting relationship arranged in a row transversely of their lengths, and an elongated backing sheet bonded to the face shingles in such row with the grain of the shingles extending transversely of the length of the backing sheet, the improvement comprising the exposed face side only of each random width face shingle having a rabbeted longitudinal edge extending generally parallel to the grain of the wood of such face shingle, the rabbet being of substantially uniform depth over the major portion of the length of such face shingle and terminating adjacent to but short of the tip of the face shingle, the opposite longitudinal edge of each face shingle being unrabbeted, the underside of each face shingle being ungrooved, and the rabbeted edges of face shingles abutting unrabbeted edges of adjoining shingles in such row without obscuring the rabbets of such rabbeted edges.

4,499,702

FIVE-TAB STRIP SHINGLES

Larry S. Turner, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

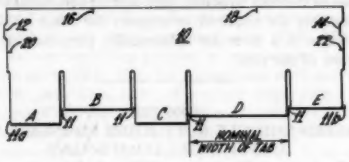
Continuation-in-part of Ser. No. 185,032, Sep. 8, 1980, abandoned. This application Dec. 28, 1981, Ser. No. 334,716

Int. Cl.³ E04D *1/26, 1/36*

U.S. Cl. 52—555 **7 Claims**

1. A cutting pattern for strip shingles all identical in shape and each having five rectangular tabs of various lengths and widths, each tab having one of three different lengths definable as short, long, and intermediate, one end tab and a middle tab of the five tabs having equal widths, the middle tab being of the long length, said one end tab being of the short length, and a tab between said middle tab and said one end tab being of the intermediate length, the cutting pattern having three lanes of the strip shingles on a sheet of shingle material, the tabs on the shingles in each of two of the lanes extending into abutting relationship with the tabs on the shingles in the other of the two lanes, and the equal-width tabs on each shingle in one of

the two lanes respectively abutting the equal-width tabs on a shingle in the other of the two lanes with the middle tab on



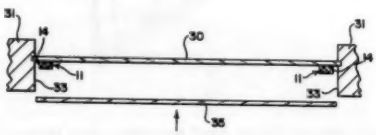
each shingle abutting the equal-width end tab on the other shingle along the full widths of the tabs.

4,499,703

METHOD OF RETRO-FITTING WINDOWS

John R. Rundo, Strongsville, Ohio, assignor to The BF Goodrich Company, New York, N.Y.

Filed Feb. 16, 1982, Ser. No. 348,907
Int. Cl.³ E04B *21/00*
U.S. Cl. 52—746 **1 Claim**



1. The method of retro-fitting a single windowpane mounted in a frame to a double windowpane comprising the steps of applying a deformable tacky adhesive sealant strip containing a desiccant with an embedded spacer therein to the glass surface of said single windowpane along the entire perimeter of said single windowpane, said embedded spacer is a corrugated ribbon with spacer side edges, said deformable strip is applied to said glass surface with one of said side edges adjacent to said glass surface to resist any compressive forces thereon, cutting a glass pane to the measured dimensions of the said single windowpane, placing said cut glass pane onto the sealant strip to abuttingly engage said strip around said perimeter wherein said strip of sealant is applied to said glass surface of said windowpane and into abutting contact with sash frame of said single windowpane as pressure is applied to said cut glass as said glass abuts said sealant strip, and locating a stop around the entire perimeter of said cut glass wherein said stop is secured to said frame of said windowpane and abuttingly engages said cut glass.

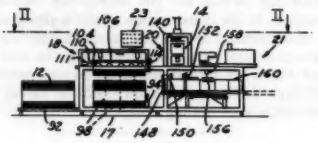
4,499,704

CORRUGATED BOX FORMING, LOADING AND SEALING MACHINE

Forrest C. Bacon, Invergrove Heights, and Keith W. Nord, Stillwater, both of Minn., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Oct. 13, 1983, Ser. No. 542,921
Int. Cl.³ B65B *35/54, 47/10, 49/08*
U.S. Cl. 53—156 **5 Claims**

2. For forming a corrugated box from a body blank including bottom, front, back, two top half panels, and edge panels on opposite side edges of each of said bottom, front, back and two top half panels, and two side panel blanks, loading the box with a container-type product, and sealing the box, a machine comprising a first magazine for storing a stack of said body blanks in a horizontal flat attitude; a loading station; oppositely disposed, spaced apart second and third magazines for storing side panel blanks in a vertical attitude on opposite sides of said loading station; an opening in said loading station; means for conveying one body blank at a time from said stack in said first magazine into said loading station such that said bottom panel of said body blank is above said opening; a first set of glue guns for applying glue to said opposite edge portions of said body blank; means for feeding a designated number of rows of a selected number of products and a side panel blank from opposite sides of said loading station onto said bottom panel; supporting and lowering means for lowering said loaded bottom panel and said side panels, thereby causing said front and back panels to bend upwardly while entering said opening against said products and said glued edge panels to bend inwardly so



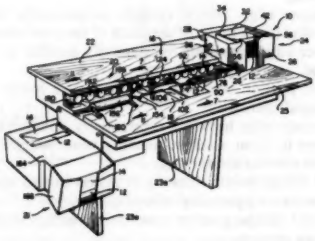
as to become sealed to said side panels to form a filled open-topped box; fourth pusher means for bending the rear top half panel forward onto the products and for pushing said box forward; stationary rail means for engaging and bending the front top half panel rearward onto the products; and a second set of glue guns for applying glue to the upper edge portions of said side panel blanks intermediate said sealed front and back edge panels; means for urging said edge panels on said two top half panels downwardly into contact with said glued edge portions of said side panel blanks to complete the sealing of said box.

4,499,705

SEMI-AUTOMATIC INSERTION MACHINE FOR ENVELOPES

Robert J. Russell, Skokie, Ill., assignor to Mail-Ex Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 337,835, Jan. 7, 1982, , which is a continuation of Ser. No. 106,239, Dec. 21, 1979, abandoned, and Ser. No. 940,728, Sep. 7, 1978, abandoned. This application Mar. 17, 1982, Ser. No. 359,038
Int. Cl.³ B65B *7/00*
U.S. Cl. 53—266 A **18 Claims**



1. A machine for facilitating the manual insertion of materials by an operator into envelopes of the type having a body and an adjacent seal flap provided with exposed self-sealing adhesive, said machine comprising: a hopper for receiving a quantity of envelopes and including means normally supporting the envelopes in stacked relation with the envelope seal flaps in superposed extended position, means for withdrawing envelopes in one by one relationship from the hopper, means independent of said normal stack supporting means and separately engageable with the envelope stack as additional support

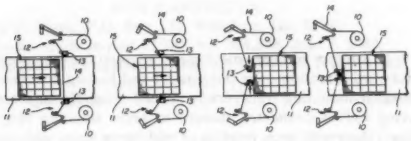
therefor for inhibiting removal of remaining envelopes in the hopper as each envelope is withdrawn, an inserter station, means for translating each envelope withdrawn from the hopper to the inserter station, means at the inserter station for separating the envelope side walls to facilitate the introduction of materials into the envelope, a guide plate at the inserter station for guiding materials into the envelope, translating means for removing a filled envelope from the inserter station, and flap closing means operable upoh the filled envelope for sealing the flap onto the adjacent envelope side wall.

4,499,706

PASS THROUGH STRETCH WRAPPING PROCESS

Andor Scheller, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 19, 1983, Ser. No. 496,168
Int. Cl.³ B65B *11/08, 11/58*
U.S. Cl. 53—399 **10 Claims**



1. A method of bundling a body of goods which comprise stretching under tension a dual layer film of a thermoplastic circumferentially around the body, and joining the film together at a line where the film meets to encircle the body; said film having sufficient elongation to permit at least 10% stretching under tension and sufficient slip between the layers of the film to permit relative slippage, and wherein the molecules of one layer of the film are aligned generally crosswise of the molecules of the second layer of film thereby increasing tear resistance of the dual layer film.

4,499,707

METHOD AND APPARATUS FOR BALING A TOW OF TEXTILE FILAMENTS

Gilles Desjobert, Brignais, and André Jaillet, Geneuille, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Mar. 10, 1980, Ser. No. 128,804
Claims priority, application France, Mar. 9, 1979, 79 06312
The portion of the term of this patent subsequent to Aug. 13, 1999, has been disclaimed.
Int. Cl.³ B65B *63/04*
U.S. Cl. 53—429 **8 Claims**

1. In a process for baling a tow of continuous textile filaments in a baling cycle in which a tow is fed to a container having a sidewall by a laying means driven with an oscillating movement between maximum oscillating positions about a median position, the improvement comprising,

filling said container while constantly gripping a beginning end of the tow while the tow is being fed to said container by said laying means;

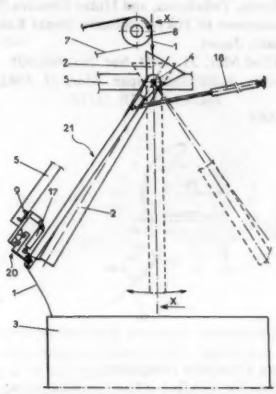
releasing the gripped beginning end of the tow when the filling of the container is completed;

displacing the tow downstream of the oscillating laying means by means of a member driven with a pendular movement, to bring the tow to a fixed means for gripping the tow, the fixed gripping means being located at a position which is beyond the maximum oscillating position of the oscillating laying means;

stopping the feed of the tow and the oscillating movement of the laying means;

automatically cutting the continuous tow originating from outside the container by means of a blade adjacent to the fixed gripping means, to form a beginning end of tow for a new container, that end of the cut tow formed by said automatic cutting, which is integral with the tow located in the container, falling over the sidewall of the container and the newly formed beginning end of tow, integral with the tow fed in through the laying means, being gripped until a new container is filled;

replacing the filled container with a new container; and



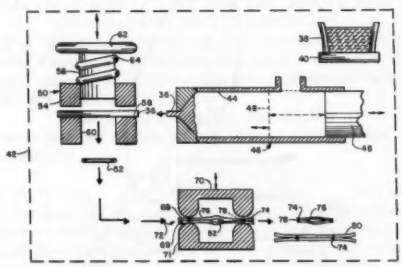
restarting the feed of the tow and returning the member driven with a pendular movement to a rest position which is essentially symmetrical to the fixed gripping means, relative to the median position in the oscillating movement of the laying means, and filling the new container.

4,499,708

METHOD OF EXTRUDING AND PACKAGING A THIN SAMPLE OF REACTIVE MATERIAL INCLUDING FORMING THE EXTRUSION DIE

Edward F. Lewandowski, Westmont, and Leroy L. Peterson, Joliet, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 30, 1981, Ser. No. 326,087
Int. Cl.³ G21K *1/10*
U.S. Cl. 53—432 **7 Claims**



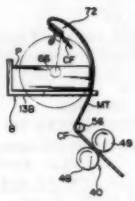
1. In a method of using an electric discharge machine for forming a very narrow slot in a work piece with an electrode of thin cross section even narrower than the slot, comprising the steps of forming in the work piece typically by drilling two openings significantly large in diameter than the slot width at the opposite ends of where the slot will be, imposing a large potential between the electrode and the work piece, advancing the electrode toward the work piece to cause arcing under a bath of oil, whereby the slot is cut from the work piece and the slot as being cut is flushed by oil in the openings, and plugging

the through openings with a durable solid material to leave only the slot.

4,499,709
BUNDLING APPARATUS

Toshiyuki Miyano, Yokohama, and Hideo Ohmura, Tokyo, both of Japan, assignors to Tokyo Shibuara Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 31, 1983, Ser. No. 480,901
Claims priority, application Japan, Mar. 31, 1982, 57-52912
Int. Cl.[3] B65B *13/10*
U.S. Cl. 53—589 9 Claims

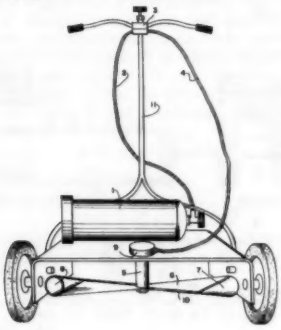


1. A bundling apparatus comprising:
winding means for winding a band coated on one side with a thermally fusible material around objects to be bundled so that one end of the band is joined with another portion of the band;
turning means for turning up the one end of the band so that both end portions of the coated side of the band face each other, thereby forming a turnup portion; and
heating means for heating either of the turnup portion and that portion of the band on the objects to be bundled which is joined with the turnup portion to fuse the fusible material between the two portions, thereby thermally bonding the portions together.

4,499,710
JET POWER LAWN MOWER

John D. Bolton, 5 Shiloh Cir., Irvine, Calif. 92714

Filed Feb. 9, 1984, Ser. No. 578,498
Int. Cl.[3] A01D *35/262*
U.S. Cl. 56—11.9 1 Claim

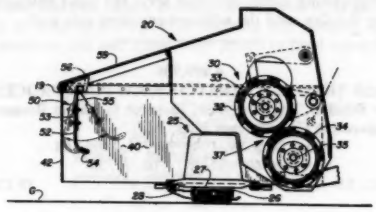


1. A lawn mower comprising a wheel-supported mower deck, a blade rotatively supported within said deck, said blade including a forward cutting portion and jet cones at each end, a reservoir of compressed gas mounted on said deck, conducting tubes extending between said reservoir and said jet cones for directing gas from said reservoir to said cones, and control means for actuating the release of gas from said reservoir to said cones with the gas release through said cones causing said blade to rotate and cut grass.

4,499,711
DEFLECTOR PANEL FOR DISC MOWER-CONDITIONER

Kenneth W. McLean, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Mar. 2, 1984, Ser. No. 585,674
Int. Cl.[3] A01D *35/26*
U.S. Cl. 56—13.6 14 Claims

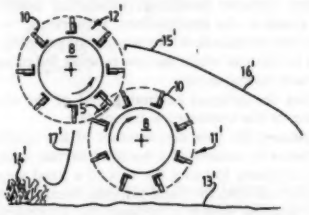


1. In a rotary mowing mechanism adapted for movement in a forward direction over the ground and having a transverse cutterbar mounting transversely spaced rotatable cutter units having knives connected thereto to sever standing crop by impact therewith upon rotation of said cutter units, said cutterbar housing drive transmission means operably connected with said cutter units to transfer rotational power thereto; a flexible curtain supported from a frame member and extending around the front and transverse sides of said cutterbar, said curtain including a transversely extending portion spaced forwardly of said cutterbar; and drive means operably connected to said drive transmission means to deliver rotational power thereto, the improvement comprising:
a transverse deflector supported from said frame member between the transverse portion of said curtain and said cutterbar to restrict the movement of the transverse portion of said curtain toward said cutterbar.

4,499,712
CROP ENGAGING APPARATUS AND METHODS

Wilfred E. Klinner, Milton Keynes, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 173,136, Nov. 30, 1979, Pat. No. 4,398,384. This application May 14, 1982, Ser. No. 378,492
Claims priority, application United Kingdom, May 15, 1981, 8114981
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.[3] A01D *14/02*
U.S. Cl. 56—16.4 35 Claims



1. Apparatus for treating crop comprising
two cooperating rotors mounted for counter rotation about parallel axes for passage of crop between the rotors,
at least one rotor comprising a crop treating rotor having a plurality of stiff, resilient, outwardly directed crop engaging elements having sharp tips on the outer ends thereof

for treating crop, and the other rotor having a plurality of stiff, resilient, outwardly directed crop engaging elements, the arrangement being such that in operation the rotors rotate with the outer perimeters of the rotors overlapping and with regular inter-meshing of crop engaging elements on one rotor with crop engaging elements on the other rotor in such a manner that the crop engaging elements of the said other rotor tend to press crop into gaps between the crop treating elements on the said one rotor which has the sharp tips so that the crop is laid across the outer ends of the elements on the said one rotor for treating the crop at least predominantly by a spiking action.

4,499,713

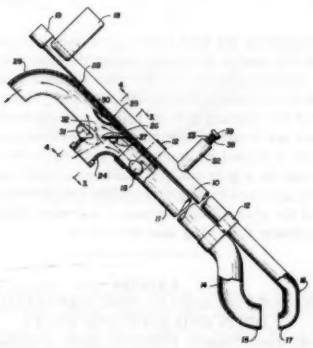
NUT HARVESTER

Emory B. Stone, P.O. Box 121, Whigham, Ga. 31797

Continuation-in-part of Ser. No. 384,595, Jun. 3, 1982, abandoned. This application Jul. 18, 1983, Ser. No. 514,602

Int. Cl.³ A01D *51/00*

U.S. Cl. 56—328 R **9 Claims**



1. A portable nut harvester adapted to be bodily carried by a user comprising an air stream delivery tube having a lower terminal adapted to direct an air stream substantially horizontally at ground level, a coating conveyor tube having a ground level entrance spaced from and substantially coaxial with said terminal of the air stream delivery tube, a separator unit on the rearward end of the conveyor tube including a lateral outlet sleeve adapted for connection with a harvested nut collection receptacle, a nut deflector near said outlet sleeve in the path of travel of harvested nuts through the conveyor tube and deflecting the nuts through the outlet sleeve, means on the separator unit forming a venturi-like throat near the mouth of the outlet sleeve and causing debris entrained within the air stream of the conveyor tube to be carried beyond the outlet sleeve and deflector to an exit point on the separator unit substantially rearwardly of said outlet sleeve, said means on the separator unit comprising a first spoon-like element attached to the top wall of the separator unit somewhat rearwardly of the deflector and having its convex side disposed lowermost, and a pair of opposite side spoon-like elements on the separator unit below the first spoon-like element and having laterally opposing concave faces, the three spoon-like elements forming within the separator unit a region of reduced pressure near the entrance to the lateral outlet sleeve whereby entrained debris is prevented from entering the outlet sleeve and is accelerated through a throat of the separator unit and expelled from the rear of the separator unit.

4,499,714

METHOD OF BALING, AND BALING PRESS

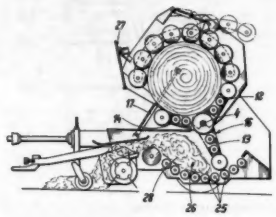
Bernd Hollmann, Bielefeld, Fed. Rep. of Germany, assignor to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Dec. 16, 1982, Ser. No. 450,542

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151580

Int. Cl.³ A01D *39/00*

U.S. Cl. 56—341 **15 Claims**



1. A baling press for stalk products, comprising

a displaceable pressure chamber for winding a product and forming a round bale therein;

a storage chamber arranged for storing a product and supplying it to said pressure chamber;

transport elements peripherally limiting said chambers and arranged so that when said pressure chamber displaces to block a further product supply into said pressure chamber and to release a product supply into said storage chamber said transport elements deflect a product flow and peripherally limit said storage chamber, when an outer contour of the round bale is fixed and said storage chamber is opened said transport elements are displaced so that they discharge the bale from the storage chamber, transfer the stored product from said storage chamber to said pressure chamber and guide a new product flow into the latter, and thereupon said transport elements peripherally close a bottom part of said pressure chamber to form a next bale; and further comprising a turnable star having three legs which support said transport elements, said turnable star having a part which forms a partition between said pressure chamber and said storage chamber.

4,499,715

METHOD AND DEVICE FOR THE KNOT-FREE CONNECTION OF TWO THREADS

Manfred Chardon; Reinhard Mauries; Joachim Rohner, and Heinz Zumfeld, all of Mönchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 453,879

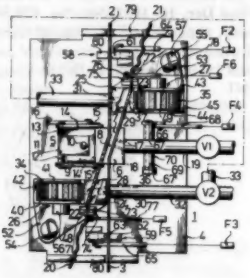
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151270

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **15 Claims**

1. Method for the knot-free connection of two threads formed of textile fibers of limited length having at least one twisted fiber strand, including a splicing device for mutually tangling, intermixing and intertwining individual fibers of the two threads, which comprises inserting the two threads coming from opposite sides into the splicing device, trimming the end of each thread to a predetermined distance from the splicing device, vibrating, loosening, combing and separating the thread ends into individual fibers, cleaning and spreading apart each thread end by blowing compressed air into the splicing device obliquely to the longitudinal direction of the individual fibers and by beating, pulling and tearing with mechanical and pneumatic stresses in direction toward the thread ends, withdrawing the prepared thread ends from opposite sides up to the splicing device, tangling, mixing and hooking the individual

fibers of the two thread ends to each other to form a splice connecting the threads after setting the splicing device in



operation, introducing a thread twist into the splice, and removing the connected threads from the splicing device.

4,499,716

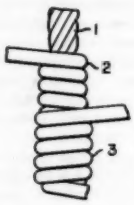
REINFORCEMENT STRUCTURE

Paul S. Antal, and Manfred Katz, both of Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jun. 13, 1983, Ser. No. 503,656

Int. Cl.[3] **D02G** *3/36, 3/38, 3/40, 3/48*

U.S. Cl. 57—234 **9 Claims**



1. A reinforcement structure consisting of a core surrounded by a sheath, said core being under at least 0.1% radial compression and comprising longitudinally aligned yarn and said sheath comprising a helical wrapping of yarn with adjacent turns of the helical wrapping abutting and being positioned at an angle to the core of between 80 and 90 degrees, the ratio of sheath thickness to the radius of the reinforcement structure being from 0.01 to 0.25, and the yarn of both sheath and core having a tenacity greater than 10 dN/tex, and an initial modulus greater than 200 dN/tex.

4,499,717

METHOD OF AND APPARATUS FOR PRODUCING TWISTLESS YARNS FROM GLUED SEPARATE FIBERS FITTED TOGETHER

Milko D. Dimitrov, Sofia, Bulgaria, assignor to N P S P "Novotex", Sofia, Bulgaria

Filed Jul. 22, 1982, Ser. No. 400,977

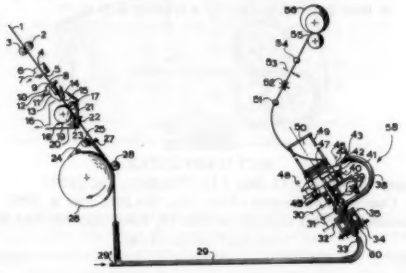
Claims priority, application Bulgaria, Jul. 22, 1981, 53025

Int. Cl.[3] **D02G** *3/40;* **D01H** *5/28, 13/28, 13/30*

U.S. Cl. 57—297 **40 Claims**

1. In a method of producing twistless yarns from glued together separate fibers, wherein continuously fed tape is impregnated with a glue solution, a part of the glue solution is removed from the tape, and then the tape is dried and wound onto a package, the improvement wherein the continuously fed tape is first fed in a straight line, during such straight line initial travel the tape is gyrated in a span thereof and is false twisted, a glue solution is then laid upon the false twisted tape by immersing the false twisted tape and causing it to travel downwardly through a pool of glue solution, then part of the glue solution is removed from the tape by the simultaneously calendering of the tape, and thereafter deviating the tape from the straight line of its initial travel, drying the tape, winding the dried tape into a tape reserve, and withdrawing the tape from such tape reserve and winding it into a package.

12. Apparatus for producing twistless yarns from glued-together fibers, comprising pairs of rollers for feeding a tape formed from fibers, a device downstream of the feeding rollers



for impregnating the tape with a glue solution, means downstream of the device for impregnating the tape with glue solution for removing a part of the glue solution from the tape, followed by a drying cylinder and a winder, along the mutual tangent of the feeding pair of rollers and downstream therefrom there are located consecutively a jet for false twisting the tape by air, a second jet comprising said means for impregnating the tape by a glue solution, said second jet having a tube containing glue and through which the tape enters at the upper surface of the glue solution, a pair of calender rollers, and said drying cylinder following said second jet.

4,499,718

APPARATUS FOR SEPARATING IMPURITIES FROM OPEN-END SPINNING UNITS

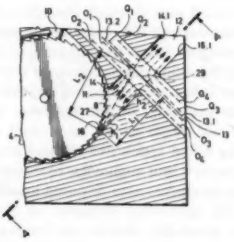
Jan Junek; Josef Skarka; Frantisek Jaros; Frantisek Hortlik; Kveta Hacova, all of Usti n/Orl.; Vaclav Vobornik, Letohrad; Vladimi Ohlidal, and Ludmila Lihtarova, both of Usti n/Orl., all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti n/Orl., Czechoslovakia

Filed Jun. 29, 1983, Ser. No. 509,244

Claims priority, application Czechoslovakia, Jul. 12, 1982, 5306-82

Int. Cl.[3] **D01H** *7/888, 7/892*

U.S. Cl. 57—301 **8 Claims**



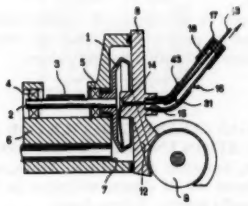
1. In an apparatus for separating impurities from an open-end spinning unit having a driven spinning rotor, said apparatus having a housing, a cylindrical recess in the housing, a fiber separating cylinder accommodated in the cylindrical recess of the housing, a cleaning aperture in the cylindrical surface of

said recess, said cleaning aperture merging into an impurity separating duct through which air flows to the fiber separating cylinder and to the spinning rotor of the unit in counter-direction relative to the flying-off of the impurities, the impurity separating duct being followed by an impurity withdrawing duct communicating with a sub-atmospheric pressure source, an atmospheric air supply aperture being provided in the outlet of said impurity separating duct and at the inlet of said impurity withdrawing duct, the improvement wherein the apparatus has at least one atmospheric air supply aperture which is symmetrical with respect to a plane passing substantially through the axis of the impurity separating duct and disposed perpendicular to the axis of the fiber separating cylinder, the axis of the atmospheric air aperture forming the same angle with the opposite walls of said impurity separating duct and with the walls of the impurity withdrawing duct.

4,499,719
FREED-FIBER SPINNING DEVICES

René Faessler, Mulhouse, France, assignor to Societe Alsacienne de Construction de Materiel Textile, Mulhouse, France

Filed Aug. 30, 1983, Ser. No. 527,867
Claims priority, application France, Sep. 8, 1982, 82 15213
Int. Cl.³ D01H 7/882
U.S. Cl. 57—417 7 Claims



1. In a freed-fiber spinning device having a hollow rotor mounted for high speed rotation and being subjected to a partial vacuum in its hollow interior, means for delivering textile yarn from the interior of said rotor along the geometrical axis of the rotor, a yarn exit tube having an entrance end communicating with said yarn delivering means and the partial vacuum in said rotor for receiving the yarn therein, take-up means for drawing the yarn through the exit tube, and an elbowed portion in said yarn exit tube for modifying the direction of the path of the yarn as it passes through the exit tube, the improvement comprising;

a recess penetrating through the elbowed portion of the yarn exit tube in the zone of the generator-line having the shortest radius of curvature of said elbowed portion;

a detachable member having a configuration identical with the configuration of the portion of the tube removed to form said recess so that the detachable member fits in position against the periphery of said recess and has inner and outer surfaces ensuring respectively the continuity of the inner and outer surfaces of said exit tube interrupted by said recess;

a false-twist rib integrally formed in one piece with said detachable member and extending thereon across the geometrical plane formed by a length of yarn upstream and a length of yarn downstream of said rib so that said rib is disposed within said yarn exit tube and said yarn passes against said rib as it is drawn through the exit tube by said take-up means;

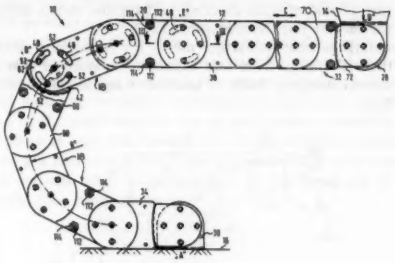
said false-twist rib having a rounded cross-section against which said yarn passes; and

a removable retaining means for stationarily fixing said detachable member in said recess.

4,499,720
CABLE CARRIER

Ernst Klein, Dusseldorf, Fed. Rep. of Germany, assignor to A&A Manufacturing Co., Inc., New Berlin, Wis.

Filed Jan. 19, 1983, Ser. No. 459,043
Int. Cl.³ F16G 13/00
U.S. Cl. 59—78.1 4 Claims



1. In a conductor guiding support formed of two chains retained in parallel spaced-apart relationship for receiving the conductors between them, each of said chains being formed of a plurality of links coupled to each other successively for limited pivotal movement relative to each other; each of said links being formed of two plates joined together in face-to-face, matching relationship; one end portion of said plates being offset from the other portion so that when said plates are joined together to form a link the offset portions are in surface contact with each other; a central boss extending from the offset portions of both matching plates so that the central boss of one plate abuts the central boss of the matching plate when the link is assembled; an off-center boss extending from the surfaces of said offset portions of both matching plates so that the offset boss of one plate abut the offset boss of the matching plate when the link is assembled; a central bore in each of said plates at the portion opposite said offset portion so that the contacting portions of said plates of a succeeding link can be inserted into the space between said offset portions of the preceding link with the central bore of said contacting portions in engagement with the central bosses of said offset portions to produce a pivotal connection; an arcuate slot in each of said plates at the contacting portion opposite said offset portion for receiving the offset bosses of the succeeding link when the links are coupled together to limit the pivotal movement of the links relative to each other; and means welding the abutting surfaces of each of said bosses together for securing the two plates together with the succeeding link coupled thereto by the engagement of said bosses with the central bore and arcuate slot of the succeeding link.

4,499,721
CONTROL SYSTEM FOR CHENG DUAL-FLUID CYCLE ENGINE SYSTEM

Dah Y. Cheng, Los Altos Hills, Calif., assignor to International Power Technology, Inc., Palo Alto, Calif.

Division of Ser. No. 273,269, Jun. 12, 1981, Pat. No. 4,417,438.
This application Mar. 21, 1983, Ser. No. 477,693
The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.
Int. Cl.³ F02C 7/00, 7/10
U.S. Cl. 60—39.05 3 Claims

1. The method of operating a dual-fluid heat engine at partial load conditions, which engine conprises:

a chamber;

compressor means for introducing a first gaseous working fluid into said chamber, said compressor means having a predetermined pressure ratio (CPR);

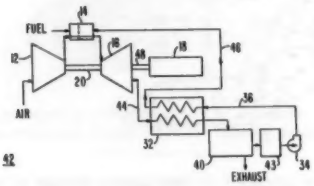
means for introducing a second liquid-vapor working fluid

in the form of a vapor within said chamber at a defined second/first working fluid ratio (XMIX);

means for heating said first gaseous working fluid and said second working fluid in the vapor form in said chamber at a defined specific heat input rate (SHIR);

turbine means responsive to the mixture of said first and second working fluids for converting the energy associated with the mixture to mechanical energy, the temperature of said mixture entering said turbine means defining the turbine inlet temperature (TIT);

counterflow heat exchanger means for transfering residual thermal energy from said exhausted mixture of first and second working fluids to said incoming second working fluid,



said method comprising the steps of:

preheating the second working fluid in the heat exchanger to a superheated vapor state prior to its introduction within the chamber; and

selecting XMIX and SHIR so that:

(a) for a given value of TIT, XMIX is substantially equal to or is greater than $XMIX_{peak}$, where $XMIX_{peak}$ occurs by both

(i) maximizing the temperature of the superheated second working fluid vapor; and

(ii) minimizing the effective temperature of the exhausted mixture of the first and second working fluids; and

(b) TIT decreases as engine load decreases.

4,499,722

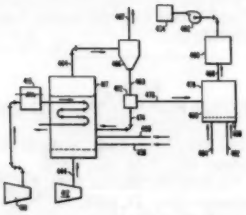
HIGH TEMPERATURE GAS TURBINE SYSTEMS

James R. Hamm, Murrysville, and William E. Young, Churchill, both of Pa., assignors to KRW Energy Systems Inc., Houston, Tex.

Division of Ser. No. 222,093, Jan. 2, 1981, Pat. No. 4,369,624. This application Sep. 21, 1982, Ser. No. 420,668

Int. Cl.³ F02C *3/28*

U.S. Cl. 60—39.12 **1 Claim**



1. A high temperature gas turbine generation system comprising:

a compressor;

means for conducting a gaseous oxidant to said compressor;

a first reactor housing a fluidized bed wherein particulate coal is reacted with a discharge gas to produce heat, char and other reaction products;

means for conducting compressed gaseous oxidant from said compressor to and through said first reactor, in heat exchange relation with said fluidized bed so as to heat said oxidant;

a second fluidized bed reactor wherein said char is reacted with oxygen and steam to provide a fuel gas and product ash;

means for conducting said char from said first reactor to said second reactor;

a combustor producing a high temperature gaseous product from said heated oxidant and said fuel gas;

means for conducting said heated oxidant to said combustor;

means for conducting said fuel gas to said combustor;

an expander having an inlet for receiving said high temperature gaseous product and an outlet for discharging said discharge gas;

means for conducting said high temperature gaseous product to said expander inlet; and

means for conducting said discharge gas from said expander outlet to said first fluidized bed reactor.

4,499,723

TRIS(2-AZIDOETHYL)AMINE AND METHOD OF PREPARATION THEREOF

Milton B. Frankel, Tarzana, and Edgar R. Wilson, Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 26, 1982, Ser. No. 401,476

Int. Cl.³ C06D *5/08;* **C07C** *117/00*

U.S. Cl. 60—211 **3 Claims**

1. A compound of the formula $N—(CH_2CH_2N_3)_3$.

2. A method of propulsion comprising reacting a tris(2-azidoethyl) amine fuel with a liquid oxidizer.

4,499,724

EXHAUST GAS CLEANING DEVICE FOR INTERNAL COMBUSTION ENGINE OF MOTORCYCLE

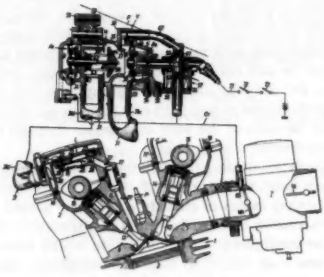
Yasuo Ikenoya, Kawagoe; Shuso Ueda, Asaka, and Masafumi Araki, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,427

Claims priority, application Japan, Dec. 18, 1981, 56-204709

Int. Cl.³ F01N *3/22*

U.S. Cl. 60—290 **4 Claims**



1. An internal combustion engine for use with motorcycles comprising:

an intake system;

an exhaust system;

a carburetor disposed in said intake system;

a starting aid for expediting the engine starting; and

an exhaust gas cleaning means for supplying secondary air to said exhaust system to clean the exhaust gas flowing therethrough, said exhaust gas cleaning means comprising

(a) a secondary-air supply passage communicated with said exhaust system, and

(b) a secondary-air control valve device disposed in an intermediate portion of said secondary-air supply passage to

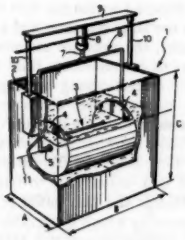
regulate the flow rate of the secondary air flowing through said secondary-air supply passage, said secondary-air control valve device including first and second control valves disposed in said secondary-air supply passage, said first and second valve operation mechanisms associated with said second control valve, wherein said first control valve is closed at the time of deceleration of the engine by detecting intake vacuum in said intake system downstream of said carburetor whereas said second control valve is closed by said first valve operation mechanism on detecting the actuation of said starting aid and a vehicle speed below a set value; said second control valve is also closeable by said second valve operation mechanism in acceleration and high-speed operation ranges by detecting the intake vacuum in the intake system downstream of said carburetor.

4,499,725

HYDRAULIC MACHINE

Marino Sbrizzai, Via Parenzo 95, Torino, Italy

Filed Jun. 29, 1983, Ser. No. 509,191
Int. Cl.³ F03B *13/00*
U.S. Cl. 60—506 **7 Claims**



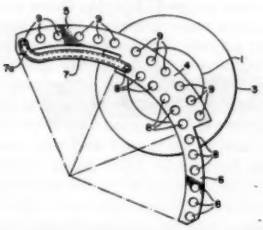
1. A hydraulic machine, comprising
a reservoir filled with a fluid,
a rotor freely rotatably supported about a horizontal axis within the reservoir, the rotor being so shaped that the centre of buoyancy and resultant force to which the rotor is subject when it is completely immersed in the fluid is not located on the axis of rotation of the rotor, and
means for causing a variation in the volume of the fluid within the reservoir.

4,499,726

HEATER HEAD FOR A MULTI-CYLINDER HOT GAS ENGINE

Christer Bratt, Malmö , Sweden, assignor to United Stirling AB, Malmö , Sweden

Filed Dec. 6, 1983, Ser. No. 558,478
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—517 **3 Claims**



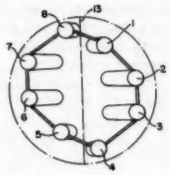
1. In a heater for a multi-cylinder hot gas engine of the type having regenerator housings of annular cross section surrounding the cylinders of the engine, said heater head comprising arcuately shaped primary manifolds connected to the cylinder tops, arcuately shaped secondary manifolds connected to the regenerator housing tops, and a plurality of equally shaped heater tubes connecting said primary and secondary manifolds which when mounted together form two coaxially disposed, circular tube connections, the improvement comprising each of said primary manifolds extending arcuately through 360/2·n degrees where n is the number of engine cylinders, each of said primary manifolds including two coaxially disposed segments of tube connections, and each regenerator housing being provided with two secondary manifold segments, each of which being of the same angular size as said primary manifold and extending at each side thereof, one of said secondary segments forming a part of the outer one of said circular tube connections and the other forming a part of the inner one of said circular tube connections.

4,499,727

HOT GAS ENGINE

Stefan Lorant, Oxie, Sweden, assignor to United Stirling AB, Sweden

Filed Mar. 28, 1983, Ser. No. 479,469
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—525 **4 Claims**



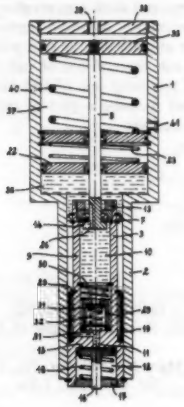
1. A hot gas engine of the type having a plurality of cylinders each of which contains a piston separating two working gas charges and being connected to a common crank shaft and in which each of the plurality of working gas charges is oscillated between variable volume chambers defined by the pistons and cylinders and of different temperatures so as to perform working cycles each of which consists of a compression in a low temperature variable volume chamber, a displacement to a high temperature variable volume chamber, an expansion in said high temperature chamber and a displacement back to said low temperature chamber, said engine further comprising
said plurality of cylinders being greater than six;
all of said cylinders being series interconnected to form a single loop,
a cold gas connecting duct, a cooler, a regenerator and a heater connecting each low temperature variable volume chamber to the high temperature variable volume chamber of a neighboring cylinder;
the cylinders and respective pistons being associated in pairs of two, the respective cranks of which on said common crankshaft being angularly displaced relative to one another to constrain the two pistons of each associated pair to perform identical simultaneous movement in their respective cylinders
the pistons in each of said associated cylinder pair being at the same point in the working gas cycle of the respective cylinder.

4,499,728

HYDRAULIC PRESS MECHANISM

Marcel P. Therond, 8c, Chemin de Balme Baron, 69140 Rillieux-La-Pape, France

PCT No. PCT/FR81/00034, § 371 Date Oct. 30, 1981, § 102(e) Date Oct. 30, 1981, PCT Pub. No. WO81/02543, PCT Pub. Date Sep. 17, 1981
PCT Filed Mar. 11, 1981, Ser. No. 317,902
Claims priority, application France, Mar. 12, 1980, 80 05955
Int. Cl.³ F15B 7/00
U.S. Cl. 60—570 8 Claims



1. A hydraulic press mechanism for applying in succession a fast approach stroke to a tool juxtaposed with a workpiece and then a work stroke with substantial stress application to the workpiece, said mechanism comprising:

a housing formed with a bore axially aligned with said tool;

a main body centered on the axis of said bore and received in and axially movable along said bore, said body being formed at an end proximal to said tool with a cylindrical chamber centered on said axis and at an end remote from said tool with a compartment centered on said axis receiving a substantially incompressible fluid, said compartment being connected to said chamber through a passage in said body extending along said axis;

a secondary piston centered on said axis received in said chamber and operatively connected with said tool for displacing said tool axially toward said workpiece upon hydraulic pressurization of said chamber;

a primary piston centered on said axis and axially shiftable in said housing and extending into said compartment of said body for displacement of fluid from said compartment through said passage to said chamber;

coupling means for releasably coupling said body to said primary piston whereby displacement of said primary piston and said body towards said workpiece displaces said secondary piston with said fast approach stroke until said tool contacts said workpiece;

an expansible casing on said body centered on said axis and exposed to said fluid for expansion by fluid pressure upon engagement of said tool with said workpiece for blocking said body against said housing whereby further displacement of said primary piston into said compartment displaces fluid therein to displace said secondary piston with said work stroke;

control means including a stem extending along said axis and operatively connected with said primary piston for displacing same, and an actuator displaceable in opposite directions for said stem, said secondary piston being biased by a return spring in said body away from said workpiece; and

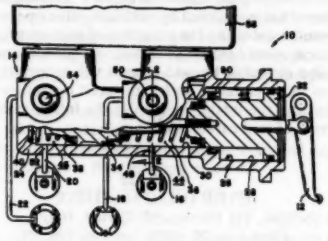
sealing means for isolating said actuator from said fluid.

4,499,729

FAST-FILL MASTER CYLINDER

Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 2, 1983, Ser. No. 500,515
Int. Cl.³ B60T 11/08
U.S. Cl. 60—578 11 Claims



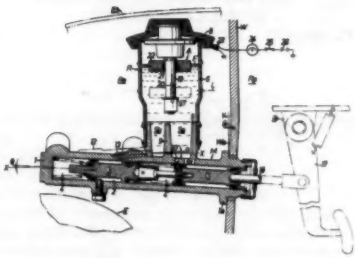
1. A fast-fill master cylinder comprising a housing with a stepped bore therein defining a large diameter and a small diameter, a piston disposed within the bore in order to define a fast-fill chamber in the large diameter and a pressure chamber in the small diameter, the pressure chamber communicating with an outlet port to communicate fluid from the pressure chamber to a brake circuit during braking when the piston moves within the stepped bore, characterized in that said housing defines passage means extending from said fast-fill chamber to said outlet port independently of said pressure chamber whereby fluid from the fast-fill chamber communicates directly with said outlet port to bypass said pressure chamber during braking, and said outlet port receives a proportioning valve assembly which is operable during braking to communicate said passage means and said fast-fill chamber with a reservoir formed by said housing after an initial brake application, said proportioning valve assembly initially communicating fluid pressure freely from said pressure chamber to said brake circuit during braking, and thereafter said proportioning valve assembly being operable to reduce the communication between said pressure chamber and said brake circuit in response to increasing fluid pressure in said pressure chamber.

4,499,730

AUTOMOTIVE TANDEM TYPE MASTER CYLINDER

Hiroshi Kasahara, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed May 6, 1981, Ser. No. 261,267
Claims priority, application Japan, May 26, 1980, 55-69778
Int. Cl.³ B60T 11/26
U.S. Cl. 60—585 6 Claims



1. An automotive tandem type master cylinder comprising a cylinder body provided with mutually independent front and rear oil pressure chambers and mounted on a front wall of a

passenger compartment in a forwardly upwardly inclined manner relative to a horizontal plane, an auxiliary oil reservoir having first and second reservoir chambers defined by a partition wall on the opposite sides thereof and integrally formed on an upper portion of said cylinder body adjacent to said rear oil pressure chamber, a relief port and a supply port for said rear oil pressure chamber open at a bottom wall of said first reservoir chamber,

an oil passage in a side wall of said cylinder body at a rearwardly upwards inclination to the horizontal plane for connecting a relief port and a supply port for said front oil pressure chamber with said second reservoir chamber, and a main oil reservoir adjacent said auxiliary oil reservoir and communicating with said first and second reservoir chambers, said oil passage being provided in a longitudinal projection integrally formed on the outer periphery of said cylinder body, said longitudinal projection extending from the front base of said auxiliary oil reservoir in a direction forwardly and somewhat sidewardly of said cylinder body, said longitudinal projection being formed at its front face with an opening for said oil passage, said opening being plugged with a blank plug.

4,499,731

CONTROLLABLE EXHAUST GAS TURBOCHARGER

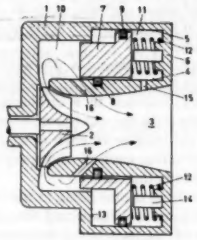
Peter Moser, Boppelsen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 29, 1982, Ser. No. 427,004

Claims priority, application Switzerland, Dec. 9, 1981, 7858/81

Int. Cl.³ F02B *37/00*; F01D *17/12*

U.S. Cl. 60—602 **10 Claims**



1. An exhaust gas turbine for an exhaust gas turbocharger, comprising:

a turbine casing surrounding the turbine wheel that is mounted on the rotor shaft and having an inlet volute space;

wall element means movable along the rotor shaft axis in a cylindrical part of said inlet volute space, said wall element means being arranged for altering the volume and the flow cross section of the inlet volute space for the exhaust gases of the engine, said wall element means including a control piston having:

a circular cylindrical body, which is guided in at least one circular cylindrical bore of the turbine casing, and

a cylindrical volute body, whose cross section substantially corresponds to the cross section in the cylindrical part of the inlet volute space normal to the rotor shaft axis and is guided in this cylindrical part; and

spring means for biasing the control piston in the direction towards the inlet volute space.

4,499,732

TURBOCHARGER HAVING A VARIABLE INLET AREA TURBINE

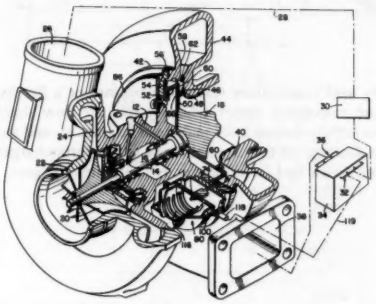
David T. Szczupak, Huddersfield; Brian E. Walsham, Holmfirth; Desmond J. Hooley, Marsden; David Flaxington, Bradford; Peter S. McKean, Huddersfield, and John D. Wescott, Skelmanthorpe, all of England, assignors to Holset Engineering Company Limited, Huddersfield, England

Filed Nov. 15, 1982, Ser. No. 441,461

Claims priority, application United Kingdom, Nov. 14, 1981, 8134368

Int. Cl.³ F01D *17/14*; F02B *37/12*

U.S. Cl. 60—602 **7 Claims**



1. A turbocharger for use with an internal combustion engine and comprising a compressor having a rotatable air pressurizing impeller and a turbine comprising a turbine housing, a radial inward flow turbine wheel mounted for rotation about a central axis within the housing and connected to the compressor impeller, said housing having an annular inlet passage defined by two generally radially extending opposed side walls adjacent the periphery of the turbine wheel through which passage heated engine exhaust flows for driving the wheel, means for controlling the flow area of said passage, said control means comprising an axially displaceable ring element including a thin sheet metal stamping comprising an axially extending sleeve portion, an integral radially extending flange portion at one end of said sleeve portion extending radially inward between said sleeve portion and the periphery of said turbine wheel and a radially outwardly directed flange portion at the other end of said sleeve portion, and means connected to the radially outwardly directed flange portion for displacing the axially displaceable ring element so as to vary the flow area of the inlet passage.

4,499,733

EMERGENCY SHUTDOWN MECHANISM FOR A TURBOCHARGED DIESEL ENGINE

Richard S. Farr, Los Angeles, and John J. Dorn, Redondo Beach, both of Calif., assignors to Farr Company, El Segundo, Calif.

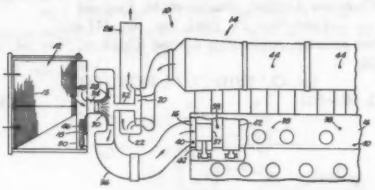
Filed Jun. 16, 1980, Ser. No. 160,139

Int. Cl.³ F02B *37/00, 77/00*

U.S. Cl. 60—611 **10 Claims**

4. An emergency shutdown mechanism for a turbocharged two-cycle diesel engine in a locomotive for preventing overspeed of the turbocharger in the event of a fire in the engine air box disposed about the crankcase, engine cylinders and a portion of the piston liner, or in the exhaust manifold, said mechanism comprising an air flow shutdown plate slidably mounted at the clean air inlet end of the turbocharger; means for moving said plate over said clear air inlet and preventing fluid flow therethrough; a plurality of temperature responsive sensors disposed within said air box between said cylinders for detecting an overheating condition within said air box; a pressure

responsive sensor disposed within said air box for detecting fires in said air box and in said exhaust manifold; means operatively connected between said means for moving said plate and said temperature and pressure responsive sensors for activating said moving means upon detection of said overheating condi-



tion by said temperature responsive sensors or a fire by said pressure responsive sensor whereby said air flow shutdown plate is rapidly moved over said clean air inlet by said moving means shutting off the clean air flow to the turbocharger and shutting down said turbocharger and said diesel engine.

4,499,734

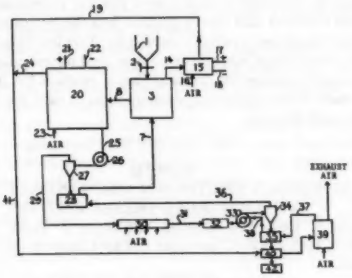
POWER GENERATION APPARATUS AND METHODS

Solomon Zaromb, 9 S. 706 William Dr., Hinsdale, Ill. 60521

Division of Ser. No. 179,274, Aug. 18, 1980, Pat. No. 4,416,954, which is a continuation-in-part of Ser. No. 704,452, Jul. 12, 1976, Pat. No. 4,305,999, Ser. No. 20,967, Mar. 16, 1979, Pat. No. 4,218,520, and Ser. No. 080,185, Oct. 1, 1979, Pat. No. 4,254,190. This application Sep. 7, 1982, Ser. No. 415,186

Int. Cl.³ H01M *8/06*

U.S. Cl. 60—673 **11 Claims**



1. Apparatus for the generation of energy from the oxidation of aluminum or its alloys which comprises:

(a) means for breaking up the continuity of the passivating oxide layer on the aluminum surface by exposing said surface to a mercury-, indium-, or gallium-containing substance;

(b) a reaction chamber wherein the surface-treated aluminum is exposed to a gaseous fluid engaging in an oxidation reaction therewith; and

(c) means for withdrawing useful energy from said oxidation reaction, wherein said energy withdrawing means is a thermal engine.

4,499,735

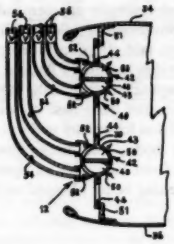
SEGMENTED ZONED FUEL INJECTION SYSTEM FOR USE WITH A COMBUSTOR

George W. Moore, Palm Beach Gardens, and Robert G. Carroll, Jupiter, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 361,015, Mar. 23, 1982,. This application Feb. 9, 1984, Ser. No. 578,304

Int. Cl.³ F02C *7/22*

U.S. Cl. 60—739 **3 Claims**



1. A removable fuel injection system for use in conjuction with a combustor, said fuel injection system comprising:

a plurality of circumferentially spaced-apart segments, each of said segments being in the form of a wedge-shaped plate;

means for mounting each of said circumferentially spaced-apart plates adjacent one another and adjacent the entrance of said combustor so as to form an annular-shaped body;

each of said plates including means for injecting fuel into said combustor and means for permitting gas to flow into said combustor;

said fuel injecting means being in the form of a plurality of radially spaced-apart tubular-shaped, circumferential spray bars, all of said spray bars lying in substantially the same radial plane;

each of said spray bars having a plurality of sets of fuel injecting orifices therein, said orifices of each of said sets of orifices being disposed in a circumferential, spaced-apart relationship with respect to one another, and a plate located within the interior of each of said tubular-shaped spray bars for dividing each of said spray bars into a pair of separate fuel injecting zones;

said gas flow permitting means being in the form of a plurality of sets of openings of preselected size, said openings of each of said sets of openings being disposed in a circumferential, spaced-apart relationship with respect to one another, and each of said sets of said openings and spray bars being alternately spaced-apart in the radial direction; and

means operably connected to each of fuel injecting zones for providing a regulated amount of fuel to each of said zones, whereby the amount and location of said fuel being injected into said combustor can be controlled.

4,499,736

DEHUMIDIFIER APPARATUS FOR DISK DRIVES

Dennis K. Lieu, and Larry Cooper, both of San Jose, Calif., assignors to Sperry Corporation, New York, N.Y.

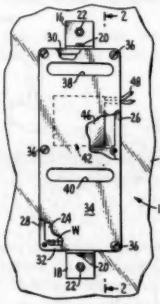
Filed Dec. 8, 1983, Ser. No. 559,547

Int. Cl.³ F25B *21/02*

U.S. Cl. 62—3 **8 Claims**

1. Dehumidifying apparatus for a disk drive system having an enclosure including an enclosure wall and a head-disk assembly within the enclosure comprising a substantially impervious housing disposed within said enclosure, said housing defining a chamber and having an inlet port and an outlet port communicating between said enclosure and said chamber to

establish an air passage, means for mounting said housing to said enclosure wall interior of said enclosure so that said inlet port is disposed above said outlet port, and a Peltier effect device mounted in said chamber and having power input conductors, said Peltier effect device has a substantially right parallelepiped shape, first and second planar surfaces on said parallelepiped shape, said first surface being a hot surface and said second surface being a cold surface in response to applica-



tion of power to said conductors, said housing having a rear wall defining an excision substantially similar in shape to Peltier effect device, said Peltier effect device being disposed in said excision for affording contact between said hot surface and said enclosure wall, and said cold surface being exposed to said chamber between said inlet port and said outlet port, so that air traversing said chamber from said inlet port flows past said cold surface and water vapor in the air condenses on said cold surface.

4,499,737

METHOD AND DILUTION REFRIGERATOR FOR COOLING AT TEMPERATURES BELOW 1° K.

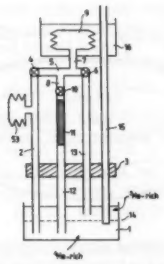
Gerd K. Binnig, Richterswil, and Christoph E. Gerber, Adliswil, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,707

Claims priority, application European Pat. Off., Mar. 23, 1982, 82102407.2

Int. Cl.³ F25D *1/00*

U.S. Cl. 62—56 **12 Claims**



1. Method for cooling at temperatures below 1° K. by adiabatically diluting liquid ^{3}He in liquid ^{4}He and re-circulating the reconcentrated ^{3}He into the dilution chamber, characterized by pumping the liquid ^{4}He rich mixture of ^{3}He-^{4}He from the dilution chamber (1), separating the ^{4}He from the ^{3}He-^{4}He rich mixture by placing it in communication with a filter (11) permeable only for ^{4}He II atoms and returning the resultant reconcentrated ^{3}He rich mixture of ^{3}He-^{4}He to the dilution chamber (1), the filtering generating cold at the lower end of said filter (11) and consuming heat by re-mixing ^{3}He with ^{4}He in the dilution chamber, the cold being used in a heat exchanger (3) to pre-cool the returning ^{3}He stream.

4,499,738

CONTROL DEVICE FOR A REFRIGERATOR

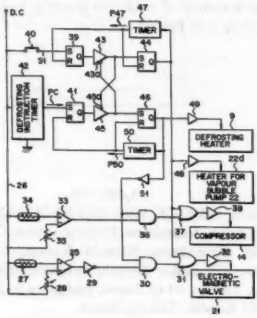
Takeshi Motoyama; Toshiyuki Onishi, and Kunio Yokoyama, all of Oosaka, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 27, 1983, Ser. No. 508,236

Claims priority, application Japan, Jun. 30, 1982, 57-99044[U]; Jun. 30, 1982, 57-99045[U]

Int. Cl.³ F25D *21/06*; G05D *23/19*; F25B *41/00*

U.S. Cl. 62—155 **4 Claims**



1. A control device for a refrigerator provided with a closed refrigerating cycle system including, in series in the following order, a compressor, a condenser, capillary tubes, an evaporator for a storage compartment, and an evaporator for a freezing compartment, comprising:

forced cooling means, including by-pass means for by-passing a coolant passage for said storage compartment evaporator, for cooling only said freezing compartment evaporator, said by-pass means comprising an electromagnetic valve having an inlet connected to a node between first and second capillary tubes and a third capillary tube whose outlet is connected to a node between said storage compartment evaporator and said freezing compartment evaporator;

forced defrosting means, positioned near a frost deposition portion in said freezing compartment on which frost is concentratedly deposited, for removing frost settled on said frost depositing position;

first control means for driving said forced cooling means in response to a first instruction signal supplied thereto and which comprises a first flip-flop circuit which is set upon receipt of said first instruction signal, a third flip-flop circuit which is set upon receipt of an output signal from said first flip-flop circuit, a timer which is actuated by an output signal from said third flip-flop circuit and produces a timer pulse after a prescribed length of time, causing said first and third flip-flop circuits to be reset, and circuit means for, upon receipt of the output signal from said third flip-flop circuit, opening said electromagnetic valve and actuating said compressor;

second control means for driving said forced defrosting means when supplied with a second instruction signal and which comprises a second flip-flop circuit which is set upon receipt of said second instruction signal, a fourth flip-flop circuit which is set upon receipt of an output signal from said second flip-flop circuit, a timer which is actuated upon receipt of an output signal from said fourth flip-flop circuit, and issues a timer pulse after a prescribed length of time, causing said second and fourth flip-flop circuits to be reset, and circuit means for, upon receipt of

the output signal from said fourth flip-flop circuit, energizing a heater for said forced defrosting means and preventing said compressor from being operated; and

preferential control means, comprising a first transfer gate connected between the output of said first flip-flop circuit and the set input of said third flip-flop circuit, and a second transfer gate connected between the output of said second flip-flop circuit and the set input of said fourth flip-flop circuit, said first transfer gate being rendered conductive only when a gate terminal of said first transfer gate receives a low level signal from an output terminal of said second transfer gate, said second transfer gate being rendered conductive only when a gate terminal of said second transfer gate receives a low level signal from the output terminal of said first transfer gate, for controlling defrosting and forced cooling.

4,499,739

CONTROL DEVICE FOR REFRIGERATION CYCLE

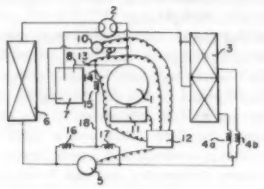
Fumio Matsuoka, Kamakura; Hitoshi Iijima, Chigasaki; Kisuke Yamazaki, Kamakura; Hiroshi Kasagi, Chigasaki; Yasuo Nakashima, Shizuoka; Kiyoshi Sakuma, Fujieda, and Mitsuo Umehara, Toride, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 526,383

Claims priority, application Japan, Nov. 22, 1982, 57-204976

Int. Cl.³ F25B *41/04, 13/00*

U.S. Cl. 62—212 **5 Claims**



1. A control device for a refrigeration cycle constructed with a compressor, a four-way valve for change-over of a cooling medium, a condenser, an electrically operated expansion valve, an evaporator and an accumulator, all being serially connected, said control device further comprising a by-pass extending at least one terminal of said expansion valve to an inlet of said compressor through a capillary tube; a first temperature sensor to detect temperature of the cooling medium at an open end to the inlet side of said compressor in said by-pass; a second temperature sensor to detect temperature of the cooling medium within an intake tubing, through which the cooling medium is taken into said compressor through the inlet thereof; and a control device which calculates a super-heat quantity of the cooling medium taken into said compressor on the basis of a difference between detected outputs of said first and second temperature sensors, and performs control of a degree of opening of said electrically operated expansion valve, wherein a separate by-pass from the compressor outlet to the accumulator having an electromagnetic valve controlled by said control device which causes a high temperature and high pressure cooling medium from the discharge side of said compressor to be by-passed into the accumulator at the time of defrosting operation by said air conditioning device utilizing refrigeration cycle for increasing the pressure of the low pressure cooling medium from said evaporator.

4,499,740

FREEZER

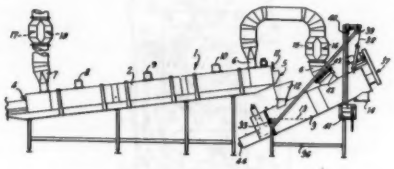
Geoffrey I. Older, Basingstoke, and Leigh S. Webb, Winchester, both of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 28, 1983, Ser. No. 546,678

Claims priority, application United Kingdom, Oct. 29, 1982, 8230972

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—374 **12 Claims**



1. A freezer which comprises a cooling tunnel for precooling foodstuff, and a freezing tunnel which has (1) a product immersion section in which precooled foodstuff from said cooling tunnel can be immersed in a liquid cryogen, (2) an equalization section in which foodstuff which has been immersed in said liquid cryogen can be maintained in contact with vapour from said liquid cryogen; and (3) means to convey said foodstuff from said liquid cryogen and through said equalization section, characterized in that said means comprises a ribbon auger which, in use, lifts the foodstuff out of the liquid nitrogen and conveys it through the equalization section wherein the ribbon auger comprises a portion having a relatively large pitch and a portion having a relatively small pitch, the arrangement being such that, in use, foodstuff is moved relatively rapidly out of said liquid cryogen and transported relatively slowly through said equalization section said portion of the ribbon auger which, in use, rotates in liquid nitrogen, comprises two flights.

4,499,741

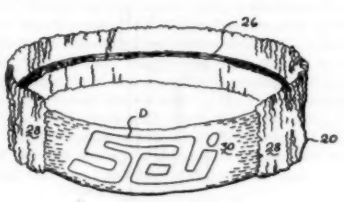
STRETCHABLE KNITTED ARTICLE WITH PRINTED DESIGN

Ronald R. Harris, Lincolnton, N.C., assignor to Kemfast Textiles, Inc., Granite Falls, N.C.

Filed May 19, 1982, Ser. No. 379,642

Int. Cl.³ D04B *1/02*

U.S. Cl. 66—171 **4 Claims**



1. A stretchable knitted article comprising a knitted fabric including yarn formed in loops extending in courses and wales on the outward surface of said fabric, a predominant region of said outward surface being formed with terry knit loops and said terry knit region being integrally knit with a smaller plain knit region of said outward surface, said plain knit region being of a reverse-side single jersey loop construction arranged for coursewise stretching in ordinary use of said article such that the portions of said yarn of said plain knit region which are outwardly visible in the unstretched condition of said article are substantially the only portions of said yarn of said plain knit region which are outwardly visible in the coursewise stretched

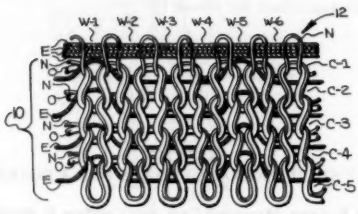
condition of said article, and a design printed on said outwardly visible portions of said yarn of said plain knit region, whereby said design maintains its definition and continuity of appearance in both said unstretched and stretched conditions of said article.

4,499,742

CREW SOCK WITH NONROLL SELVAGE TOP

William H. Burn, Niota, Tenn., assignor to Crescent Hosiery Mills, Niota, Tenn.

Filed Mar. 4, 1982, Ser. No. 354,661
Int. Cl.³ D04B *9/24, 9/46*
U.S. Cl. 66—172 E **6 Claims**



1. In a sock of the crew or athletic type including a leg and wherein said leg includes successive courses knit with a non-stretchable body yarn and a textured stretchable auxiliary yarn in plated relationship to form double yarn stitch loops, and a polyurethane elastic yarn incorporated in certain courses of said double yarn stitch loops, the combination therewith of a nonroll selvage comprising a plurality of rounds of polyurethane elastic yarn, and a single course of plain stitch loops knit solely of said textured stretchable yarn to form single yarn stretchable plain jersey stitch loops in every wale, the lower ends of the single yarn stretchable plain jersey stitch loops of said single course being joined to the upper ends of the double yarn stitch loops of the first course of the portion of said leg adjacent said nonroll selvage, and single yarn stretchable plain jersey stitch loops of said single course being alternately positioned in front of and behind said rounds of polyurethane elastic yarn with said textured stretchable yarn connecting the upper ends of adjacent stitch loops surrounding and passing over said rounds of polyurethane elastic yarn in contracted condition so that said rounds of polyurethane elastic yarn are drawn together and held closely against the double yarn stitch loops of the first course of the portion of said leg adjacent said nonroll selvage to provide a small upstanding bead extending around the upper end of said sock.

4,499,743

CLOTHING DRYCLEANING MACHINE

Gino Maestrelli, Milan, Italy, assignor to Maestrelli S.P.A., Milan, Italy

Filed Sep. 29, 1983, Ser. No. 537,044
Claims priority, application Italy, Oct. 8, 1982, 23683 A/82
Int. Cl.³ D06F *43/08*
U.S. Cl. 68—18 C **6 Claims**

1. A clothing drycleaning machine of a closed circuit type comprising:

a permanently closed pneumatic circuit for drying and solvent removing (or recovery) air,

a drum wherein clothes are contained, said drum having an inlet and being provided in said circuit;

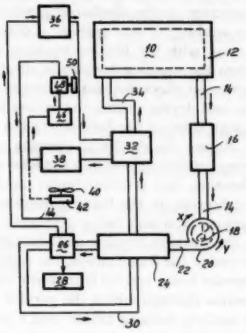
at least one air circulation fan arranged in said circuit;

refrigerating fluid equipment connected in said circuit;

at least one evaporator in the refrigerating equipment for cooling the air coming from the drum and for condensing the solvent therein contained;

at least a first condenser in said refrigerating equipment arranged downstream from said evaporator for heating the air to be recirculated in the drum;

at least one heat exchanger arranged in said circuit to carry-out a heat exchange between the air flows upstream and respectively downstream said evaporator of the refrigerating equipment; and



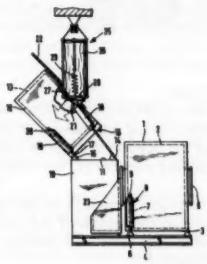
means, provided in said refrigerating equipment, for controlling heating efficiency of the condenser and/or cooling efficiency of the evaporator, depending on the required air temperatures and flow rates during the drying and solvent removing phases.

4,499,744

DRY-CLEANING APPARATUS

Gustav Kötter, and Peter Mutschlknaus, both of Melle, Fed. Rep. of Germany, assignors to Multimatic Maschinen GmbH & Co., Melle, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,465
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1982, 3224043
Int. Cl.³ D06F *39/00*
U.S. Cl. 68—210 **4 Claims**



1. A dry-cleaning apparatus comprising:

frame means, a drying housing pivotably mounted on the frame means, a drying drum mounted in the drying housing, a washing housing pivotably mounted on the frame means above the drying housing, a washing drum mounted in the washing housing, the drying housing and washing housing being pivotable about parallel axes extending transversely to an axis of the drying drum and an axis of the washing drum, the washing drum being positioned above the drying drum so that the axis of the washing drum and the axis of the drying drum are substantially aligned after both housings have been pivoted from the frame means through an acute angle, the drying housing defining a loading opening for loading the drying drum, a door for closing the loading opening, the washing housing

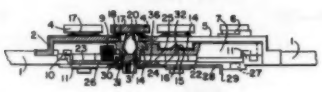
being oppositely pivotable about a second axis parallel and spaced from its first mentioned axis to pivot between a loading position and a discharge position, the washing housing defining an opening for use in filling the washing drum when the washing housing is pivoted in one direction to the loading position and for use in emptying the washing drum when the washing housing is pivoted in the opposite direction to the discharge position, a door for closing the washing drum opening, a conveying means communicating with the loading opening of the drying housing when the washing housing is pivoted to the discharge position to effect the said alignment of the axes of the washing and drying drums, the drying housing defining a discharge opening for discharging the drying drum, a door for closing the discharge opening, the discharge opening being located opposite to the loading opening of the dryer housing, two piston-cylinder units for pivoting the washing housing to the loading position and the discharge position, each unit being pivotably connected at one end to the washing housing and pivotably connected at the other end to the frame means, the ends connected to the frame means being spaced from each other and form pivotable points through which the parallel spaced pivot axes of the washing housing extend, and a piston-cylinder unit for pivoting the drying housing being pivotably connected at one end to the drying housing and pivotably connected at the other end to the frame means to pivot the drying housing for filling and discharge of the drying drum.

4,499,745

COMBINATION CYLINDER LOCK

Jacques Ricouard, Sancoins, and Jean-Pierre Quillet, Charenton-du-Cher, both of France, assignors to L.A.S. Ricouard S.A., Courbevoie, France

Filed Jan. 29, 1981, Ser. No. 229,499
Claims priority, application France, Jan. 31, 1980, 80 02068
Int. Cl.³ E05B *37/00*
U.S. Cl. 70—285 **2 Claims**



1. A lock comprising:

(a) an elongate casing (2) having an outer surface (5) which is outermost when in use and having an inner surface (23) which is inside the container when in use,

(b) at least one locking member (1) movably connected with the casing,

(c) a rocker (7) movably mounted in the casing on an axis disposed parallel to the length of the casing, said rocker being engageable (11) with said locking member (1) to lock it when required,

(d) first elastic means (9) for moving the rocker on its axis in one direction which is for locking,

(e) a key-operable lock cylinder (6) mounted rotatably on the casing,

(f) a plurality of wheels (3) mounted rotatably in the casing, said wheels having finger engageable means (4) on their outer ends, said wheels having their axes parallel to each other and in a plane that is parallel to the length of the casing and which also contains the axis of said lock cylinder,

(g) projections (16) on the rocker so arranged that when the wheels are rotated to their unlocking positions said elastic means (9) moves the rocker to engage the projections in recesses (15),

(h) a slide (22) slidably mounted against said inner surface (23), said slide being engageable with the cylinder (6,27) and with said wheels (3,33,35) to lock the cylinder and wheels against rotation,

(i) counter-wheels (14) mounted one on each of said wheels (3),

(j) recesses (15) within the casing, one by each of said counter-wheels,

(k) second elastic means (20) holding each counter-wheel (14) to its wheel (3) in a rotatably adjustable manner,

(l) projection means (30) on said slide engageable with said counter-wheels to hold them, when required, against rotation, and

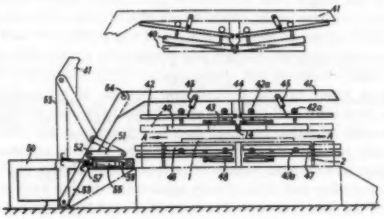
(m) cam means (12,13) on the cylinder (6) and rocker (7) whereby rotation of the cylinder can rock the rocker to its position where it locks (11) the movable member (1) and disengages from the wheels (3).

4,499,746

HEAT SHIELD ARRANGEMENTS FOR A ROLLING MILL

William R. Laws, Worcester Park, and Geoffrey R. Reed, Tadworth, both of England, assignors to Encomech Engineering Services Limited, Hounslow, England

Division of Ser. No. 351,148, Feb. 22, 1982, Pat. No. 4,463,585, which is a division of Ser. No. 091,752, Nov. 6, 1979, Pat. No. 4,343,168, which is a continuation-in-part of Ser. No. 902,560, May 3, 1978, abandoned. This application Feb. 2, 1984, Ser. No. 576,473
Claims priority, application United Kingdom, May 4, 1977, 18760/77; Apr. 27, 1978, 16704/78; Nov. 7, 1978, 43506/78
Int. Cl.³ B21B *37/10, 43/00, 45/02*
U.S. Cl. 72—13 **8 Claims**



1. An arrangement for use with hot strip material being processed in a hot-rolling mill, the arrangement comprising heat-insulating panels, support means mounting said panels in respective series above and below a path for said hot material through said mill, said panels each having a heat-insulating core and a cover plate forming an overlying main face for each of said panels, said cover plate facing said hot material and forming a hot face of said panel to radiate back heat from said hot material, said panels being operated with the temperature of said cover plates close to that of the adjacent surface of said hot material, at least some of said panels being disposed with individual panels side-by-side across the lateral extent of the arrangement, and adjustment means being connected to said individual panels for adjustably displacing said panels in opposite lateral directions relative to each other to vary their heat-insulating effect on a central region of said hot material relative to said effect on outer lateral margins of said hot material, and at least one array of temperature sensors being laterally spaced across said material path for actuation of said adjustment means in order to selectively control the temperature profile of said hot material in accordance with predetermined values.

4,499,747

POWER DRIVEN DISC CULTIVATOR APPARATUS

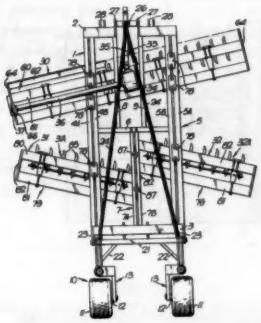
Frederick H. Ewers, The White House, Badby Lodge Farm, Daventry, Northamptonshire, N11 6OD, England

Filed Jan. 12, 1983, Ser. No. 457,287

Claims priority, application United Kingdom, Jan. 14, 1982, 8201054; Jul. 5, 1982, 8219334

Int. Cl.³ A01B *9/00*

U.S. Cl. 172—68 **3 Claims**



1. Disc cultivator apparatus comprising an elongate main frame having a leading end and a trailing end; means at the leading end for enabling connection of the main frame to a towing vehicle;

a main sub-frame assembly including a first shaft, a first plurality of cultivator disc elements mountable in spaced relationship on the shaft and constrained to rotate therewith; a first elongate sub-frame adapted rotatably to mount the first shaft, and a first connection means for enabling the main sub-frame assembly to be mountable to the elongate main frame such that its position lengthwise of the main frame and its angular setting relative to the main frame may be separately and selectively set;

a drive transmission means for transmitting drive from a power source of the towing vehicle to the shaft to enable rotation of the shaft at a speed and direction independent of the rate of advance of the apparatus;

and a second sub-frame assembly including at least one-second shaft, a second plurality of cultivator disc elements mountable in spaced relationship on each second shaft a second elongate sub-frame for each said second shaft, each second elongate sub-frame being adapted rotatably to mount an associated second shaft, and second connection means for each second sub-frame assembly for enabling the associated assembly to be mountable to the main frame at a location to the rear of the main sub-frame assembly such that the associated assembly may be positioned lengthwise of the main frame and angularly set relative to the main frame independently of each other.

4,499,748

ROLLING MILL

Mitsuo Nihei, and Hidetoshi Nishi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1983, Ser. No. 456,106

Claims priority, application Japan, Jan. 6, 1982, 57-265; Jan. 22, 1982, 57-7645

Int. Cl.³ B21B *31/08, 31/18, 29/00*

U.S. Cl. 72—238 **15 Claims**

1. A rolling mill, comprising:

a roll housing;

a pair of work rolls having parallel axes and being mounted within said roll housing;

work roll chocks mounted within said roll housing and supporting respective opposite ends of said work rolls;

a pair of intermediate rolls mounted on parallel axes within said roll housing for engaging and supporting said work rolls;

intermediate roll chocks mounted within said roll housing and supporting respective opposite ends of said intermediate rolls;

a pair of backup rolls mounted within said roll housing for contacting and supporting said intermediate rolls;

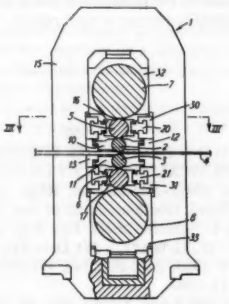
intermediate roll benders for bending said intermediate rolls;

work roll benders in said roll housing and engaging said work roll chocks for bending said work rolls;

said intermediate roll chocks and said work roll chocks having laterally, with respect to said roll axes, outermost faces;

said intermediate roll chock outermost faces and roll benders being closer to the centre plane of the rolling mill than said work roll chock outermost faces and work roll benders;

drive means having two drive shafts respectively axially connected to and to rotate each intermediate roll, and said drive means being located on only one axial side of said roll housing;



means for causing relative axial displacement of the intermediate rolls relative to each other and said roll housing, comprising movable blocks separately mounted within said roll housing on opposite sides of each intermediate roll to be displaceable in the axial direction of the intermediate rolls inside the roll housing, and said movable blocks supporting said intermediate roll chocks while permitting them to move vertically;

disconnectable means connecting the movable blocks and the intermediate roll chocks to move together in the axial direction during said axial displacement and to disconnect for permitting roll change on the opposite axial side of said roll housing;

said means for moving the movable blocks being on said one axial side of said roll housing with said drive means and further comprising, for each intermediate roll, a pair of cylinders operatively connected to said movable blocks for reciprocating them in the axial direction and said pair of cylinders being located on opposite sides of the associated one of said drive shafts; and

said intermediate roll benders being provided operatively between said movable blocks and said intermediate roll chocks.

4,499,749

TUBING PERFORATOR

Robert A. Hay, II, and Brian W. Krause, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

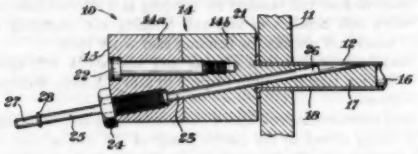
Filed Jun. 11, 1979, Ser. No. 47,422

Int. Cl.³ B21D *28/28, 31/02*

U.S. Cl. 72—325 **12 Claims**

1. A tubing perforator body, the body having a first end and

a second end, the second end of the body defining a generally cylindrical mandrel having a longitudinal axis of generation, the mandrel generally being a sliding fit within a tube which it is desired to perforate, the mandrel being disposed adjacent a generally radially extending shoulder defined by the body, the shoulder adapted to be disposed adjacent a tube sheet when the



mandrel is positioned within a tube to be perforated, a generally axially extending passageway extending from the first end of the body, through the body and terminating adjacent the second end of the generally cylindrical surface of the mandrel, the axis of the pressure being angularly disposed relative to the axis of the mandrel, the passageway being generally linear and adapted to slideably receive a rigid punch.

4,499,750

DRAWING DEVICE FOR PRESSES WITH MECHANICALLY DRIVEN DRAWING RAM

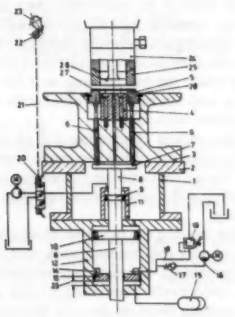
Heinz Gerber, Göpp.-Jebenhausen; Klaus Adam, Waghäusel, and Heinz Horn, Oberhausen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

PCT No. PCT/DE82/00181, § 371 Date May 9, 1983, § 102(e) Date May 9, 1983, PCT Pub. No. WO83/00821, PCT Pub. Date Mar. 17, 1983

PCT Filed Sep. 7, 1982, Ser. No. 525,906

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—351 **4 Claims**



1. A drawing device for a press for a metal sheet, the press having a mechanically driven drawing ram and with a sheet metal holder means exerting its holding force, acting on the metal sheet and counteracting the drawing direction, by way of a pressure plate by means of a die cushion piston, supporting the pressure plate and being under the effect of a pressure medium, in a fixed die cushion cylinder, comprising

a piston means having a working surface acted upon in the drawing direction and attached to the pressure plate, and

a control means operating in dependence on the ram stroke for exposing the working surface to a pressure medium to accelerate the sheet metal holder means in the drawing direction before placing the drawing ram on the metal sheet and sheet metal holder means.

4,499,751

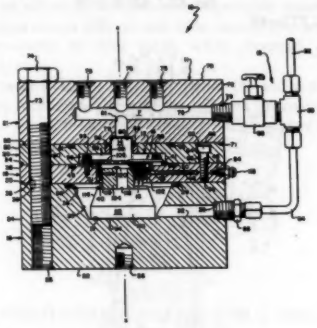
DYNAMIC PRESSURE GENERATOR

Michael T. Riggs, Batavia, N.Y., assignor to PCB Piezotronics, Inc., Depew, N.Y.

Filed Apr. 1, 1983, Ser. No. 481,148

Int. Cl.³ G01L *27/00*

U.S. Cl. 73—4 R **5 Claims**



1. A dynamic pressure generator, comprising:

a body having a chamber therewithin;

a fluid filling said chamber;

pressurizing means for statically pressurizing the fluid in said chamber;

a piston mounted in said chamber for movement relative to said body;

a suspension member flexibly holding said piston to said body, said suspension member having a plurality of openings therethrough to allow the pressure of said fluid to equalize on opposite sides of said suspension member; and

electromagnetic means acting between said body and piston and exposed to said fluid and operatively arranged to cause said piston to move relative to said body;

whereby, when said piston moves, a dynamic pressure may be superimposed on such statically-pressurized fluid.

4,499,752

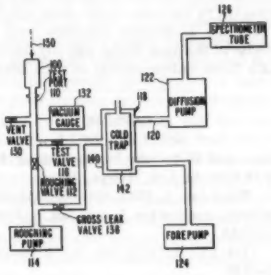
COUNTERFLOW LEAK DETECTOR WITH COLD TRAP

Paul R. Fruzzetti, N. Easton; Philip J. Leavitt, Billerica, and Frank J. Nuzzi, Methuen, all of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 22, 1983, Ser. No. 506,737

Int. Cl.³ G01M *3/20*

U.S. Cl. 73—40.7 **15 Claims**



15. Apparatus for leak detection comprising:

a test port adapted for receiving a test sample including a trace gas;

a gas analysis instrument tuned to detect said trace gas and having an inlet for receiving said trace gas;

first vacuum pumping means characterized by a relatively high reverse diffusion rate for light gases in said test sample and a relatively low reverse diffusion rate for heavy gases in said test sample, said first vacuum pumping means including a pump inlet and a foreline, said pump inlet being coupled to said inlet of said gas analysis instrument;

a cold trap;

conduit means for conducting said test sample from said test port, to said cold trap and then to said foreline of said first vacuum pumping means;

said cold trap being isolated from communication with said gas analysis instrument except in the sense that the cold trap is connected to the foreline of said first pumping means and the inlet of said first pumping means is connected to said gas analysis instrument;

second vacuum pumping means for evacuation of said apparatus in preparation for a leak test; and

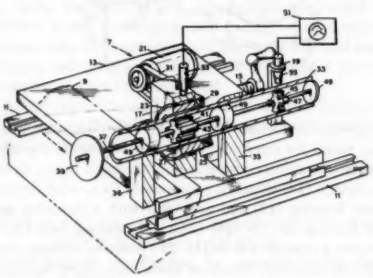
said second pumping means having its inlet connected to said conduit means between said test port and said cold trap.

4,499,753

ROTATIONAL VISCOMETER FOR HIGH-PRESSURE HIGH-TEMPERATURE FLUIDS

Kenneth R. Carr, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 6, 1983, Ser. No. 501,313
Int. Cl.³ G01N *11/14*
U.S. Cl. 73—59 **8 Claims**



1. Apparatus for generating an output indicative of the viscosity of a fluid comprising:

a tube;

a rotatable shaft having a section thereof encompassed and supported by said tube;

a rotor affixed to said shaft, for contacting said fluid;

a first magnet encompassing said tube and mounted for rotation about and reciprocation along the same;

a second magnet affixed to said shaft in magnetically attracting relation with the first magnet;

a lobed ferromagnetic member affixed to said shaft in spaced apart relation with the second magnet;

means for rotating the first magnet to effect rotation of said shaft;

means for responding to rotation of the first magnet by generating a first electrical waveform whose phase is a function of the angular position of the first magnet;

means for responding to rotation of said member by generating a second electrical waveform whose phase is a function of the angular position of said member; and

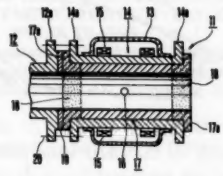
means for generating an output indicative of the phase relationship of the first and second waveforms.

4,499,754

ELECTROMAGNETIC FLOWMETER

Shinichi Akano, Honmachi; Tsutomu Goto, Tokyo; Hiroshi Watanabe, Ayase; Masato Kuroda, Fuzisawa; Sakae Ishikawa, Yokohama, and Ryoichiro Matsumoto, Yokosuka, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,277
Claims priority, application Japan, Jun. 4, 1982, 57-83254[U]
Int. Cl.³ G01F *1/58*
U.S. Cl. 73—861.12 **4 Claims**



1. An electromagnetic flowmeter for electrically measuring a flow rate of a fluid flowing through a measuring pipe coupled to a main pipe in a first direction through flanges of said measuring and main pipes, comprising:

a pair of exciting coils for generating a magnetic flux in a second direction perpendicular to the first direction in response to a flow of the fluid;

a pair of electrodes for generating an electromotive force in response to the magnetic flux generated by said pair of excitation coils, the electromotive force being generated in a third direction perpendicular to both the first and second directions;

a housing mounted on said measuring pipe so as to house said pair of exciting coils;

an insulating lining which lines said measuring pipe and which has conductive portions, said insulating lining also having flanges which are respectively joined to outer surfaces of the flanges of said measuring pipe;

a conductive powder mixed in an insulating material to constitute said conductive portions of said insulating lining; and

a gasket sandwiched between each of the flanges of said insulating lining which respectively serve as said conductive portions and a corresponding one of the flanges of said main pipe;

wherein said measuring pipe and said housing are short-circuited with the fluid, thereby providing a reference potential of a detected current corresponding to the flow rate of the fluid.

4,499,755

EMITTED ION SURGE/STALL DETECTION

Robert H. Bullis, Avon, Conn., and Robert P. Couch, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,122
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—116 **2 Claims**

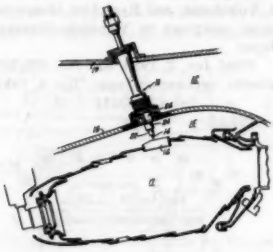
1. Apparatus for detecting surge and/or stall in a gas turbine engine comprising:

means for emitting ions into the gas stream of the engine; and

electrostatic probe means, for providing a signal indicative of impingement of the ions on the electrostatic probe means, said probe means disposed at a point in the gas stream of the engine selected such that:

the ions migrate predominantly away from the electrostatic probe means, resulting in a signal indicative of few ions migrating to and impinging on the electrostatic probe means when the gas stream is flowing in a direction indicative of normal engine operation; and

a significant number of ions flow in the direction of the electrostatic probe means, resulting in a signal indicative of a significant number of ions flowing in the direction of



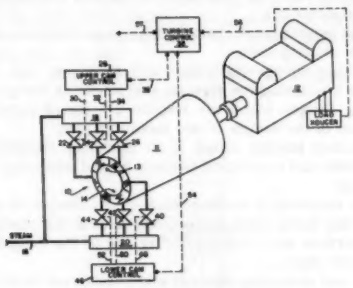
and impinging on the electrostatic probe means when there is a reverse gas stream flow in the engine indicative of a significant surge in the engine.

4,499,756

CONTROL VALVE TEST IN CAM CONTROLLED VALVE SYSTEM

Charles W. Medeiros, North Reading, and James B. Wagner, Peabody, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed May 26, 1983, Ser. No. 498,353
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **23 Claims**



1. Apparatus for testing main control valves in a steam turbine of the type having at least first and second sets of main control valves for admitting steam to said steam turbine and at least first and second cam controls for respectively controlling said first and second sets of main control valves in an actuation sequence, comprising:

first means for driving said first cam control in first a direction which performs one of opening and closing said first set of main control valves and for maintaining said second cam control stationary until a first change in a first predetermined amount in a first direction is achieved in an output of said steam turbine;

second means for driving said second cam control in a second direction which performs the other of opening and closing said second set of main control valves and for maintaining said first cam control stationary until a second change in a second predetermined amount in a second direction opposite to said first direction is achieved in said output of said steam turbine;

said first and second means being effective for alternate actuation until the one of said first and second cam controls performing closing of its respective set of main control valves attains a condition in which its related set of main control valves should be in a predetermined condition; and

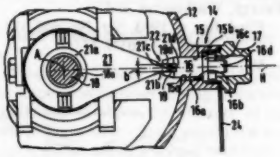
means for determining whether said related set is, in fact, in said predetermined condition.

4,499,757

DEVICE AND METHOD FOR LOCKING A DRIVE SHAFT DISPOSED IN A FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES AND HOLDING BOLT THEREFOR

Egbert Backe, August-Lammle-Str. 7, 7145 Markgröningen; Rolf Müller, Adalbert-Stifter-Str. 8, 7000 Stuttgart 40; Dieter Otto, Breslauer Str. 3, 7141 Schwieberdingen; Cornelio Leonardi, Jägerhalde 108A, 7000 Stuttgart 60; Heinrich Kochendörfer, Schumannstr. 12, 7053 Kernen; Paul Füssner, Sommerhofenstr. 167, 7032 Sindelfingen; Ewald Walker, Im Wiesengrund 30, 7014 Kornwestheim, and Rudi Rommel, Westendstr. 18, 7120 Bietigheim, all of Fed. Rep. of Germany

Filed Nov. 1, 1982, Ser. No. 438,226
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1982, 3225553
Int. Cl.³ F04B *21/00*
U.S. Cl. 73—119 A **12 Claims**



1. A device for locking a drive shaft (**18**) disposed in a fuel injection pump for internal combustion engines in a predetermined rotary position corresponding to supply onset, having a locking device (**14**) which is positionally fixed with respect to the pump housing (**12**) and provided with a fastening means (**17**) the locking device (**14**) having a holding bolt (**16**, **16'**) inserted into a reception bore (**15**, **15'**) pointing radially toward the center of the axis of the drive shaft, the holding bolt having a transverse groove (**19**) located on its end face in a cylindrical section (**16*a***, **16*a'***), wherein a form-locking connection holding the drive shaft in the predetermined rotary position is arranged with a protrusion (**22**, **22'**) of an element (**21**, **21'**) firmly connected with the drive shaft comprising:

(a) a holding collar (**16*c***) adjoining the cylindrical section (**16*a***, **16*a'***) of the holding bolt;

(b) the fastening means (**17**, **17'**, **31**) firmly clamping the holding collar against a step (**15*b***) within the reception bore (**15**, **15'**);

(c) the transverse groove (**19**) comprises an open slit having two flanks **19*a*** parallel with the longitudinal axis (H) of the holding bolt and with the longitudinal axis (A) of the drive shaft;

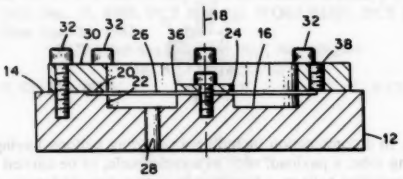
(d) the protrusion (**22**, **22'**) having a width (b) corresponding to the distance between the parallel flanks (**19*a***) of the transverse groove, and

(e) wherein the holding bolt, in a first mounting position serving to lock the drive shaft, engages the protrusion via the transverse groove and, in a second mounting position, in which the protrusion is released, the holding bolt is reversed from its first position and disengaged from the protrusion, the transverse groove pointing radially away from the drive shaft.

4,499,758
ASSEMBLY FOR TESTING WELDABILITY OF SHEET METAL

Stan A. David, Knoxville, and John J. Woodhouse, Crossville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1982, Ser. No. 447,577
Int. Cl.³ G01L *5/04*; B21J *13/08*; B23Q *3/00*
U.S. Cl. 73—159 **5 Claims**



1. A test assembly for determining weldability of sheet metal, comprising:

a base having a flat side surface, an annular groove having inner and outer walls formed in said side surface, and a counterbore having a bottom surface parallel to said side surface and an outer side wall extending between said bottom surface of said counterbore and said side surface of said base formed in the outer wall of said groove, the surface of said base circumscribed by the inner wall of said groove being substantially coplanar with the bottom surface of said counterbore;

a sheet metal test disk having an edge portion which is positioned in said counterbore and an outer surface which is substantially coplanar with said side surface of said base;

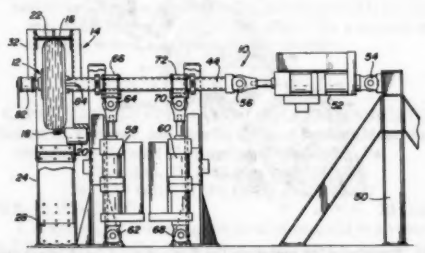
a clamp ring overlying said side surface of said base and the edge portion of said test disk; and

means for urging said clamp ring toward said side surface of said base to thereby fix the edge portion of said test disk in said counterbore.

4,499,759
ROAD SIMULATOR TESTING AUTOMOTIVE AND TRUCK WHEELS AND HUBS

Frederick H. Hull, Ft. Washington, Pa., assignor to The Budd Company, Troy, Mich.

Filed Dec. 5, 1980, Ser. No. 213,206
Int. Cl.³ G01M *17/02*
U.S. Cl. 73—146 **10 Claims**



1. Apparatus for testing a component which is normally rotated during operation comprising:

(a) a fixture for receiving said component to be tested and maintaining it relatively free from rotation during said testing;

(b) first actuator means to apply programmed lateral dynamic forces and moments to said component under test;

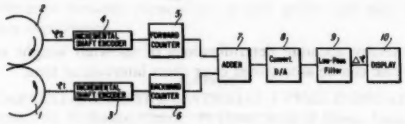
(c) second actuator means to apply programmed vertical dynamic forces and moments to said component under test;

whereby said component under test is tested without rotating said component by simulated forces representative of dynamic forces encountered under actual dynamic road conditions.

4,499,760
DEVICE AND PROCESS FOR HIGH-PRECISION MEASUREMENT OF THE PHASE RELATIONSHIP AND PHASE DISPLACEMENT, RESPECTIVELY, OF TWO PULSE TRAINS

Rudolf Fischer, Darmstadt, and Nikolaus Spiegel, Georgenhausen Reinheim, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 466,724
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1982, 3205240
Int. Cl.³ G01M *13/02*; G01P *3/56*
U.S. Cl. 73—159 **38 Claims**



1. Process for high-precision, rotational speed-independent measurement of the phase relationship and phase displacement, respectively, of two pulse trains up to a given high frequency wherein rotational angles of two rotating bodies are quantized and converted by incremental shaft encoders into pulse trains, and the pulse trains are applicable for calculating the respective phase relationship and phase displacement, which comprise the steps of:

a. counting the pulse trains generated by the two rotational bodies in at least two different counters;

b. forming a digital difference of the two counts;

c. converting the digital difference into an analog signal;

d. decoding the analog signal; and

e. displaying the decoded analog signal.

4,499,761
SNOW SCALE/RATE METER

Vernon G. Plank, Mansfield; Anthony J. Matthews, Salisbury, both of Mass.; Robert O. Berthel, Windham, N.H., and Dennis L. LaGross, Bedford, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 18, 1982, Ser. No. 442,494
Int. Cl.³ G01W *1/14*
U.S. Cl. 73—170 R **10 Claims**

1. A snow scale/rate meter comprising:

means for collecting snowfall and providing a visual indication of the amount of said snowfall collected;

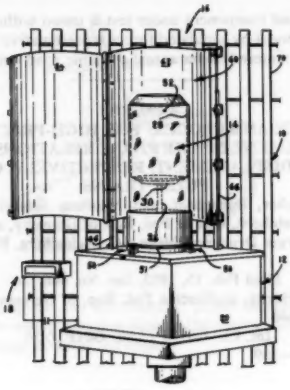
means operably connected to said snowfall collection means for accurately ascertaining the weight of said collected snowfall, said weighing means including means substantially spaced-apart from said snowfall collection means for sensing said weight of said snowfall, and means for enclosing said weight sensing means in a thermally controlled environment;

said snowfall collection means including means for dissipating heat emanating from said thermally controlled environment of said weight sensing means in order to prevent said heat from adversely affecting said collected snowfall;

means operably associated with said snowfall collection

means for substantially protecting said snowfall collection means from the adverse effects of wind; and

means for monitoring and recording said weight of snowfall over preselected intervals of time;



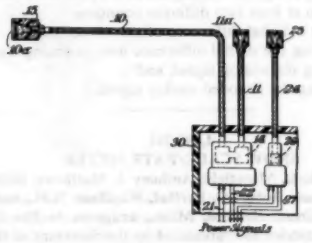
whereby accurate determinations of snowfall weight and rate can be ascertained over short intervals of time.

4,499,762

WATER WAVE MONITOR

Kevin R. Bodge, and Robert G. Dean, both of Gainesville, Fla., assignors to University of Delaware, Newark, Del.

Filed Jul. 15, 1983, Ser. No. 514,374
Int. Cl.³ G01L 9/00
U.S. Cl. 73—170 A **5 Claims**



1. A submerged service water wave monitoring apparatus comprising a device provided with a point sensor responsive to water surface displacement fitted with a pressure-to-electric transducer, and at least two differential pressure gages each having a first sensor disposed in a generally common horizontal plane in proximity with said point sensor and each having a second sensor disposed in said generally common horizontal plane spaced apart from said first sensor a distance preselected to generally conform with the length scales of the overlying waves and sufficient to permit measurement of pressure gradients therein, the angular separation of said gage sensor-to-sensor linear spacing being about 20° to about 90° with respect to each other, each said differential pressure gage being provided with a pressure-to-electric transducer, and means responsive to the output signals of said point sensor transducer and said differential pressure gage transducers developing measures of wave height, direction and frequency.

4,499,763

MEANS FOR ATTACHING A SOUNDING BALLOON

Esa Varkia, Espoo, Finland, assignor to Vaisala Oy, Finland

Filed Sep. 30, 1983, Ser. No. 537,936
Claims priority, application Finland, Jun. 13, 1983, 832316
Int. Cl.³ G01W 1/00
U.S. Cl. 73—170 R **15 Claims**

1. In a combination including a sounding balloon having a filling tube, a payload, such as a radiosonde, to be carried by the sounding balloon, a flexible connecting element having one end connected to the payload, and means for attaching the other end of the flexible connecting element to the sounding baloon, the improvement wherein the attaching means comprises:

an attachment member having an aperture formed therethrough, said aperture being defined by a marginal edge; and

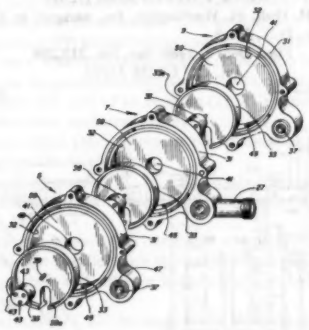
a fixing member adapted to be fitted in locking position on said attachment member with at least a portion thereof extending through said aperture, said fixing member including means for urging the filling tube of the sounding balloon against a region of said marginal edge of said aperture when said fixing member is fitted on said attachment member to fix the filling tube to said attachment member.

4,499,764

MODULAR METERING APPARATUS

Mark A. Fiorina, Milwaukee, and Todd N. Roberts, Germantown, both of Wis., assignors to Badger Meter, Inc., Milwaukee, Wis.

Filed Sep. 10, 1982, Ser. No. 416,698
Int. Cl.³ G01F 3/08
U.S. Cl. 73—253 **21 Claims**



18. Apparatus for metering the flow of fluid, said apparatus comprising: a plurality of three or more oscillating piston measuring modules in stacked relationship to each other, each of said measuring modules having a chamber through which said fluid flows, an oscillatable piston in each of said chambers which oscillates in response to the flow of fluid; and means for operatively connecting said pistons of said measuring modules

for synchronous, conjoint rotation with one another, wherein the conjoint rotation of said pistons is a measure of the total fluid flow through said measuring modules.

4,499,765

DEVICE FOR THE DETERMINATION AND/OR CONTROL OF A CERTAIN CHARGING LEVEL IN A CONTAINER

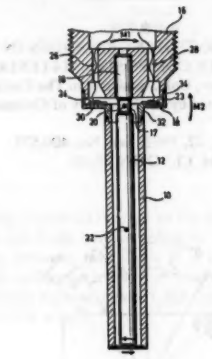
Karl Benz, Schiltach, and Gunter Kech, Wolfach-Kirnbach, both of Fed. Rep. of Germany, assignors to VEGA Grieshaber GmbH & Co. KG, Schiltach, Fed. Rep. of Germany

PCT No. PCT/DE81/00158, § 371 Date Jan. 11, 1983, § 102(e) Date Jan. 11, 1983, PCT Pub. No. WO83/01307, PCT Pub. Date Apr. 14, 1983

PCT Filed Sep. 30, 1981, Ser. No. 459,544

Int. Cl.³ G01F *23/28*

U.S. Cl. 73—290 V **6 Claims**



1. An apparatus for determining the filling level of a material in a container, comprising;

a vibration structure including inner and outer vibration elements which vibrate at the same resonant frequency in opposing directions, said elements being arranged coaxially to each other, at least one of said elements being set in the center of a membrane which acts as a return spring,

the vibrations of the outer one of said elements being muffled when the material in the container touches the same, said outer vibration element surrounding the inner vibration element,

said vibration elements (**10, 12**) having a common pivotal point (**20**),

said pivotal point (**20**) being situated in the center of said membrane (**14**) which serves as the return spring for the outer vibration element,

said inner vibration element being rod-shaped (**12**) and having, in the region of the pivotal point (**20**), a tapered area (**17**) that serves as a return spring therefor.

4,499,766

CAPACITANCE-TYPE MATERIAL LEVEL INDICATOR

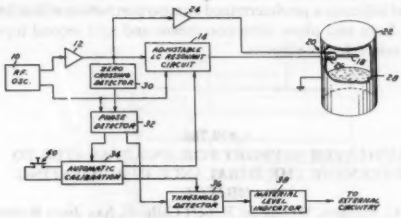
George H. Fathauer, and Charles F. Hood, both of Mesa, Ariz., assignors to Berwind Corporation, Philadelphia, Pa.

Filed Aug. 25, 1982, Ser. No. 411,527

Int. Cl.³ G01F *23/26;* **G01R** *27/26, 35/00*

U.S. Cl. 73—304 C **30 Claims**

1. A system for indicating the level of material in a vessel as a function of material capacitance comprising a parallel resonant circuit including a capacitance probe adapted to be disposed in a vessel so as to be responsive to variations in capacitance as a function of material level in said vessel, oscillator means having an output coupled to said resonant circuit including said capacitance probe, phase detection means responsive to variations in phase angle at said oscillator means as a function or probe capacitance and substantially independent of amplitude of said oscillator output coupled to said resonant circuit, calibration means for identifying a reference capacitance indicative of a predetermined level of material in said vessel, comparison means having a first input responsive to said phase detection means, a second input and an output



responsive to a comparison between said first and second inputs, said calibration means including reference means connected to said second input and indicative of said reference capacitance, and means responsive to said comparison means for indicating material level in said vessel as a function of a difference between capacitance at said probe and said reference capacitance.

4,499,767

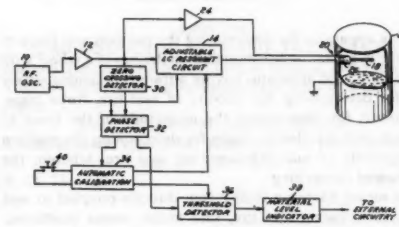
CAPACITANCE-TYPE MATERIAL LEVEL INDICATOR

George H. Fathauer; Charles F. Hood, both of Mesa, Ariz., and Robin B. Runck, Sherman Oaks, Calif., assignors to Berwind Corporation, Philadelphia, Pa.

Filed Aug. 25, 1982, Ser. No. 411,525

Int. Cl.³ G01F *23/26;* **G01R** *35/00*

U.S. Cl. 73—304 C **5 Claims**



1. A system for indicating the level of material in a vessel as a function of material capacitance comprising a resonant circuit including a capacitance probe adapted to be disposed in a vessel so as to be responsive to variations in capacitance as a function of material level in said vessel, an oscillator having an output coupled to said resonant circuit including said capacitance probe, phase detection means responsive to variations in phase angle of said oscillator output as a function of probe capacitance, calibration means for identifying a reference capacitance indicative of a predetermined level of material in said vessel, and means responsive to said phase detection means and to said calibration means for indicating material level in said vessel as a function of a difference between capacitance at said probe and said reference capacitance, said calibration means comprising comparison means having a first input responsive to said phase detection means, a second input and an output responsive to a comparison between said first and second inputs, reference means connected to said second input and indicative of said reference capacitance, means for initiating a calibration operation, counter means including means responsive to said initiating means for resetting said counter means, means responsive to said comparison means for enabling opera-

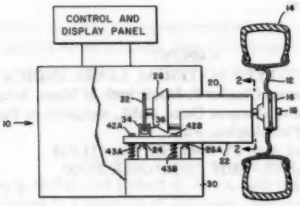
tion of said counter means during said calibration operation, and means for varying the count in said counter means during said calibration operation, means responsive to the count in said counter means for varying said reference means connected to said second input of said comparison means as a function of said count, and means responsive to said output of said comparison means for terminating said calibration operation when said output indicates a predetermined comparison between said first input from said phase detection means and said second input from said reference means.

4,499,768

CANTILEVER SUPPORT FOR AN APPARATUS TO DETERMINE THE IMBALANCE IN A ROTATING OBJECT

Allan C. Madden, Woodside; Robert Cellucci, San Jose; Robert A. Hoshida, and Duncan MacKay, both of Mountain View, all of Calif., assignors to Coats Wheel Balancer Corp., Santa Clara, Calif.

Filed Sep. 8, 1982, Ser. No. 415,898
Int. Cl.³ G01M *1/22*
U.S. Cl. 73—462 **5 Claims**



1. In an apparatus for determining the position and force of imbalance in a rotating tire mounted on the rim of a wheel with a central hub, said apparatus having a frame containing sensor means for determining the velocity of said tire, force transducer means for determining the magnitude of the force of imbalance, and calculating means for determining the position and magnitude of said imbalance on said tire, wherein the improvement comprising:

motor means having a shaft means directly coupled to said tire for rotating said tire, said motor means positioned with a portion thereof protruding from said frame in a direction towards the wheel; and

cantilever support means, for supporting said portion of said motor means protruding from said frame, said support means having a substantially planar surface for supporting said motor means on said force transducer means in said frame.

4,499,769

ACOUSTIC EMISSION MONITORING

Gregory J. Conway, Schenectady, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

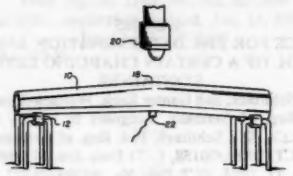
Filed Apr. 4, 1983, Ser. No. 481,973
Int. Cl.³ G01N *29/00*; B21D *3/10*
U.S. Cl. 73—587 **4 Claims**

1. Acoustic emission monitoring of straightening gun tubes comprising the steps of:

a. placing the high side of a bent gun tube upwardly as the gun tube is positioned in a horizontal position,

b. placing an acoustic emission detection device on said tube,

c. exerting a downward pressure on said high side until a plastic deformation state of said gun tube is reached as



evidenced by said detection device sensing a hissing noise emission from said tube, and

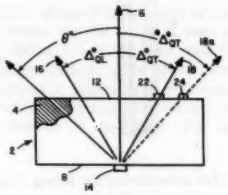
d. repeating the above steps until said gun tube is straight.

4,499,770

SYSTEMS FOR MONITORING CHANGES IN ELASTIC STIFFNESS IN COMPOSITE MATERIALS

Ronald D. Kriz, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jul. 22, 1982, Ser. No. 400,571
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—599 **13 Claims**



1. A non-destructive, non-invasive method for monitoring, measuring and/or detecting changes in elastic stiffness in a fiber/matrix composite structure composed of an isotropic matrix including fiber material distributed unidirectionally within said matrix, including the steps of:

locating an energy flux producing transducer to transmit energy flux into said composite structure; energizing said transducer so that said composite structure is subjected to traversing energy flux from said transducer; and

determining the direction which said energy flux takes through said composite structure; and

wherein the direction of said energy flux through said composite structure is determined by determining the location from which energy flux exits the composite structure.

4,499,771

ULTRASOUND VISUALIZATION SYSTEMS

Michael K. Roberts, Arvaada; Richard A. Ottosen, Denver, and Matthew L. McConnell, Boulder, all of Colo., assignors to Bion Corporation, Westminster, Colo.

Division of Ser. No. 204,589, Nov. 6, 1980, Pat. No. 4,381,675. This application Apr. 4, 1983, Ser. No. 481,810
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—632 **2 Claims**

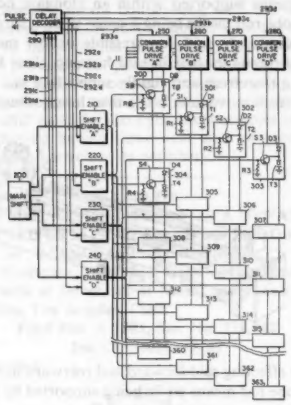
1. A method of selectively exciting an array of transducers in an ultrasound visualization and receiving echo signals therefrom, said method comprising the steps of:

(a) applying a voltage differential to a parallel array of series combinations, each combination containing a transducer and a diode;

(b) selectively discharging the voltage differential to one transducer of the array of transducers by closing a switch

in parallel with that transducer, whereby said one transducer is excited to generate an ultrasound signal;

(c) applying a current pulse to the discharged transducer to reapply a voltage differential to the discharged transducer;



(d) applying a constant current to the recharged transducer through the diode corresponding to the recharged transducer to maintain that diode in a forward biased state while the recharged transducer receives echo signals; and

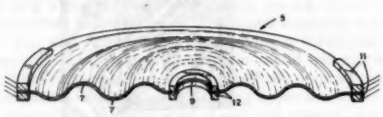
(e) sequentially repeating steps b through d with other transducers in the array.

4,499,772

FLEXURAL SUPPORT MEMBER HAVING A HIGH RATIO OF LATERAL-TO-AXIAL STIFFNESS

Wendall M. B. Haas, Covina, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 23, 1983, Ser. No. 507,189
Int. Cl.³ F16F *1/32, 1/34;* G01M *7/00;* B06B *1/04*
U.S. Cl. 73—666 **3 Claims**



1. A flexible support member for controlling reciprocating motion of a device along an axis perpendicular to the plane of said flexible support member, comprising:

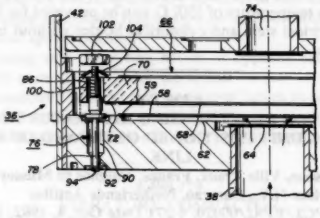
a disc formed of a metal having the properties of high tensile and fatigue strength, a thickness in the range of from about 0.01 to 0.025 inch and a plurality of concentric convolutions each having a radius in the range of from about 1 to 2.5 inches to provide a lateral-to-axial stiffness ratio greater than 1,000 to 1, said disc being mounted about its periphery and attached to said device at its center along an axis of motion perpendicular to the plane of said disc to provide free reciprocal motion of said device along said axis while substantially restraining motion of said device perpendicular to said axis.

4,499,773

VARIABLE CAPACITANCE PRESSURE TRANSDUCER

Arthur W. Crampton, Concord; Hollis L. Gray, Jr., Wayland, and Seymour Mermelstein, Newton, all of Mass., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 28, 1983, Ser. No. 489,659
Int. Cl.³ G01L *9/12;* H01G *7/00*
U.S. Cl. 73—718 **9 Claims**



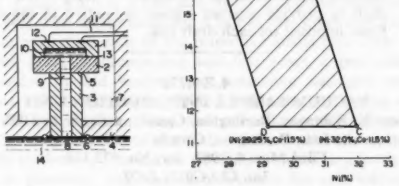
1. In a capacitor type pressure transducer including a pressure sensor comprised of a tensioned membrane, a tension plate supporting said membrane secured thereto, a removable capacitor plate positioned in a controlled superposed relation spaced from said membrane, and at least one pressure inlet in communication with said membrane and adapted to receive a source of pressurized fluid, the improvement for supporting said capacitor plate in said position relative to said membrane and comprising a plurality of flexible pins extending in a secured connection between said capacitor plate and said tension plate, each of said pins being characterized by deflection properties at least matched to absorb the potential force anticipated to be induced by an encountered temperature differential and imposed between said membrane and said capacitor plate.

4,499,774

SEMICONDUCTOR PRESSURE TRANSDUCER

Masatoshi Tsuchiya; Ko Soeno, both of Hitachi, and Tomomasa Yoshida, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 17, 1981, Ser. No. 284,340
Claims priority, application Japan, Jul. 18, 1980, 55-97537
Int. Cl.³ G01L *9/06*
U.S. Cl. 73—727 **8 Claims**



1. A semiconductor pressure transducer comprising: a piezoresistive semiconductor diaphragm; a cylindrical stem made of a glass having a thermal expansion coefficient approximating that of said diaphragm, said diaphragm being hermetically bonded by anodic bonding to one side of said cylindrical stem; and a cylindrical holder for introducing a pressurized fluid to said diaphragm through said cylindrical glass stem, said cylindrical holder being hermetically bonded by anodic bonding at one end to the other side of said glass stem to support said glass stem; wherein said holder is made of a ferromagnetic alloy material having an austenitic structure and consisting essen-

tially of Ni and Co, of which contents being within the range defined by a point A (Ni: 27.5%, Co: 16.5%), point B (Ni: 30.5%, Co: 16.5%), point C (Ni: 32.0%, Co: 11.5%) and a point D (Ni: 29.25%, Co: 11.5%) in FIG. 2, and the balance Fe, with at most small amounts of Si, Mn and C, said alloy material having been subjected to 30–90% cold working and stress relief annealing at 200°–600° C., and exhibiting a mean thermal expansion coefficient of 35×10^{-7}/°C. or less over a temperature range between 30° C. and 350° C., whereby anodic bonding up to a temperature of 350° C. can be provided for bonding said cylindrical stem and cylindrical holder without breaking of the stem.

4,499,775

TRACTOR DRAFT SENSING APPARATUS WITH SENSING UNIT POSITIONED OUTBOARD OF EACH LINK

Jean J. Lasoen, Ville Praux, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

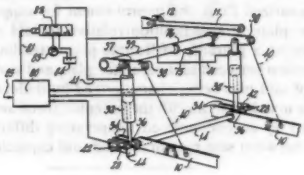
PCT No. PCT/EP82/00020, § 371 Date Oct. 4, 1982, § 102(e) Date Oct. 4, 1982, PCT Pub. No. WO82/02815, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 5, 1982, Ser. No. 440,210

Claims priority, application United Kingdom, Feb. 23, 1981, 8105861

Int. Cl.³ A01B *63/112*

U.S. Cl. 73—862.57 **8 Claims**



1. A draft sensing apparatus for use on a tractor comprising:
an elongate sensing shaft having end portions whose deflection by draft forces is to be monitored;
a pair of fulcrum supports for the shaft, the supports being arranged to support the shaft at laterally spaced locations on a tractor;
a pair of lower draft links carried on the shaft at locations outboard of the fulcrum supports and inboard of the end portions so that the imposition of a draft force on the links bends the shaft and deflects the end portions, and
a sensing unit positioned outboard of each draft link to monitor the deflection of the associated end portion of the shaft to provide separate signals indicative of the draft force imposed on each draft link.

4,499,776

VACUUM SAMPLE INTRODUCTION UNIT

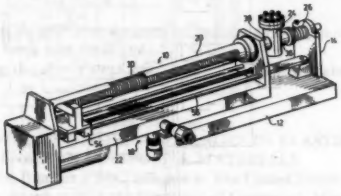
James E. Robinson, Burlington, Canada, assignor to UHV Instruments Ltd., Burlington, Canada

Filed Mar. 4, 1983, Ser. No. 472,130

Int. Cl.³ G01N *1/00*

U.S. Cl. 73—863.85 **6 Claims**

1. A sample loading device for loading samples into and unloading samples from an ultra high vacuum environment, which comprises:
an elongate rigid frame member,
an elongate housing assembly mounted to said frame member for pivotal movement relative thereto about a vertical axis and relative thereto about a horizontal axis,
means for effecting said pivotal movement about said horizontal axis and about said vertical axis,
elongate smooth-surfaced cylindrical probe rod means located in said elongate housing assembly and mounted for forward movement through an opening at one end of said housing from a retracted position to an extended position and rearward movement from said extended position to said retracted position, whereby said probe rod means may be used to effect said sample loading and unloading,
said elongate housing assembly including compressible bellows means supported within an elongate hollow tube, said probe rod means being located within, surrounded by and mounted to said compressible bellow means, roller bearing means located in said housing close to said end opening therefrom and rigidly supporting said probe rod means from movement other than longitudinally thereof, and



means for effecting said forward and rearward movement of said probe rod means while being supported by said roller bearing means, said movement effecting means comprising said compressible bellows means whereby compression of said bellows means towards said end opening by said movement effecting means effects forward movement of said probe rod means from said retracted position and expansion of compressed bellows means away from said end opening effects rearward movement of said probe rod means to said retracted position.

4,499,777

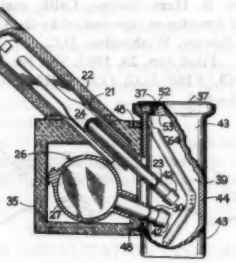
MOLTEN METAL SAMPLERS

Robert J. Hackett, Brookfield, Conn., assignor to Haly, Inc., Brookfield, Conn.

Filed Mar. 3, 1983, Ser. No. 471,769

Int. Cl.³ G01N *1/12*

U.S. Cl. 73—864.56 **15 Claims**



1. A chill mold assembly for collecting, chilling and withdrawing a flat cylindrical sample from a body of molten metal, comprising:
A. a ceramic portal tube,
B. two juxtaposable facing mold havles, each having a ring-shaped outer wall terminated by
1. a substantially flat proximal rim incorporating raised land means,
2. a distal rim,
3. and means forming a portal flange extending radially outwardly from the outer wall and having a concave trough formed therein extending through the outer wall and the flange and opening toward the proximal rim,

C. a cover disc positioned spanning the outer wall of each mold half near the distal rim

1. with protruding land means positioned between the cover disc and the mold half, maintaining a vent slot of predetermined width around the periphery of the cover disc,

D. and clamping means cooperating with the facing chill mold halves to secure them together with the raised land means of the proximal rims spacing the proximal rims apart to provide a peripheral equatorial vent slot therebetween, and with their concave troughs facingly embracing the ceramic portal tube about an inner end thereof,

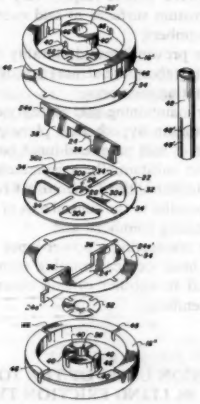
whereby a chill mold for flat cylindrical samples of solidified metal is achieved having three vent slots of predetermined minimum width encircling its periphery.

4,499,778

FLEXURE MOUNT ASSEMBLY FOR A DYNAMICALLY TUNED GYROSCOPE AND METHOD OF MANUFACTURING SAME

Robert O. Westhaver, Westwood; Gary Walker, and Menno G. Koning, both of Dover, all of Mass., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Feb. 3, 1981, Ser. No. 231,242
Int. Cl.³ G01C *19/22*
U.S. Cl. 74—5 F **21 Claims**



1. A two degree of freedom flexure mount that couples a drive shaft to an outer inertial element connected to an outer ring that is rotating about a spin axis through an inner ring that is surrounded by and substantially coaxial with said outer ring, comprising a plurality of equiangularly spaced flexure arms each extending between and secured to said inner ring and said outer ring, said flexure arms each having a horizontal web portion aligned substantially transverse to said spin axis and a vertical flexure member oriented substantially perpendicular to said horizontal web portion and having upper and lower portions disposed on opposite sides of said web portion, said web portion and flexure member being formed from a resilient structural sheet material having a substantially uniform thickness, and said web and vertical portions of each of said flexure arms being substantially continuous from said inner ring to said outer ring to provide uniform and reliably known axial, radial and torsional spring rates for each of said flexure arms said horizontal webs each extending from a central portion which together with said webs forms a substantially planar spider member that is symmetrical about the spin axis.

16. A method of manufacturing a flexure assembly comprising,

forming from a structural sheet material of substantially uniform thickness a spider member including a central hub portion and a plurality of equiangulary spaced webs each extending radially from said central hub portion with a central radial slot extending substantially the length of said web,

forming from a structural sheet material of substantially uniform thickness a plurality of cross flexure members each having generally rectangular configuration with a pair of generally rectangular key portions extending from one of its longitudinal edges,

providing upper and lower halves of an inner ring,

providing upper and lower halves of an outer ring,

interlocking said cross flexure members with said spider member by inserting said key portions in said radial slots,

positioning said inner ring halves on opposite sides of said central spider portion,

positioning said outer ring halves in opposite sides of said outer ends of said spider webs, and

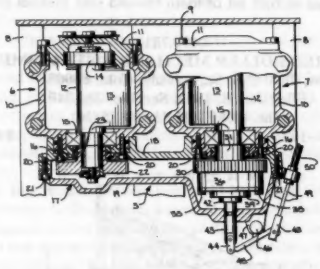
simultaneously brazing said inner ring halves to said spider, said outer ring halves to said spider and said cross flexure members to said inner and outer ring halves.

4,499,779

VIBRATORY COMPACTOR

Helmut Maass, West Bend, Wis., assignor to M-B-W Inc., Slinger, Wis.

Filed Jun. 7, 1982, Ser. No. 385,527
Int. Cl.³ F16H *33/20*
U.S. Cl. 74—61 **5 Claims**



1. In a vibration generating mechanism, a lease, a vibrating member, a pair of vibration generating units connected to the vibrating member and disposed in side-by-side relation in said base, each unit having an enclosed fixed housing and having an eccentric shaft journalled within the housing, said eccentric shafts being generally parallel and corresponding ends of said shafts projecting from the respective housings, gear train means operably connecting a power source to the projecting ends of said shafts to rotate said shafts in opposite directions, said gear train means including a pair of first gears connected to the projecting ends of the respective shafts and a pair of second gears interconnecting said first gears, a gear casing connected to said housing and containing said gear train means, a shift mechanism disposed within the gear casing and outside said fixed housings and operable to effect angular displacement of a first of said shafts relative to the other of said shafts to thereby provide an adjustment in the angularity of forces generated and reverse movement for said vibrating member, and operating means connected to the shift mechanism and disposed on the outside of said gear casing for manually operating said shift mechanism.

4,499,780

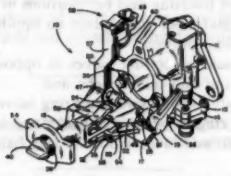
ADJUSTABLE CONTROL LINKAGE

James C. Boda, Winneconne, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 2, 1982, Ser. No. 414,117
Int. Cl.³ G05G *9/00*; F02N *17/00*
U.S. Cl. 74—107 **12 Claims**

1. An adjustable linkage for controlling engine function, said linkage including:

(a) a bracket;
(b) a first link having a first end pivotally connected to said bracket and having a second end including a pivot means;
(c) a second link pivotally attached to said pivot means; and
(d) an adjustment means formed integrally with said first link for adjusting the position of said pivot means on said



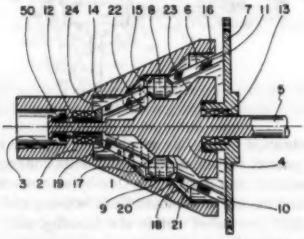
first link, said adjustment means including a first set of ratchet teeth on said first link and an arm extending from said first link with said pivot means located near an end of said arm, said arm including a second set of ratchet teeth for engaging said first set of ratchet teeth, said arm including a relatively thin section to permit bending and bias said second set of teeth toward said first set of teeth.

4,499,781

CHAMFERED ROLLER MECHANICAL TRANSMISSION

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Jun. 1, 1982, Ser. No. 384,049
Int. Cl.[3] F16H *15/16, 15/56*
U.S. Cl. 74—193 9 Claims



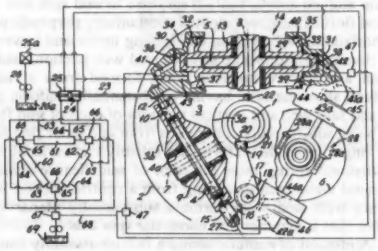
1. A chamfered roller mechanical transmission comprising in combination:
(a) an outer conical rotating member with an inner surface including a plurality of circular cylindrical surfaces of progressively varying diameters and a plurality of circular frustum surfaces disposed coaxially in an alternating fashion wherein each adjacent pair of said plurality of circular cylindrical surfaces are interconnected by each of said circular frustum surfaces in a continuous configuration;
(b) an inner conical rotating member with an outer surface including a plurality of circular cylindrical surfaces of progressively varying diameters and a plurality of circular frustum surfaces disposed coaxially in an alternating fashion wherein each adjacent pair of said plurality of circular cylindrical surfaces are interconnected by each of said circular frustum surfaces in a continuous configuration, said inner conical rotating member rotatably disposed inside of said outer conical rotating member in a coaxial relationship providing a series of circular cylindrical shell voids of a constant gap dimension and of progressively varying mean diameters and a series of circular frustum shell voids of another constant gap dimension interconnecting each adjacent pair of said series of circular cylindrical shell voids;
(c) a plurality of chamfered rollers rotatably disposed in said shell void intermediate said outer and inner conical rotating members on a common hypothetical plane perpendicular to the central axis of said outer and inner conical rotating members in a substantially axisymmetric pattern with respect to the central axis of said outer and inner conical rotating members, said plurality of chamfered rollers with the central axis disposed parallel to the central axis of said outer and inner conical rotating members including a circular cylindrical mid-section having a constant diameter matched to said a constant gap distance of said circular cylindrical shell voids and further including two chamfered extremities on opposite sides of the cylindrical mid-section wherein the diagonal distance between two diametrically opposite chamfered faces of said two chamfered extremities is matched to said another constant gap distance of said circular frustum shell voids; whereby, a rotating motion of one of said outer and inner conical rotating members is transmitted to another rotating motion of the other of said outer and inner conical rotating members by means of pressurized frictional contact provided by either said circular cylindrical mid-section of said plurality of chamfered rollers in line-contact with said circular cylindrical surfaces of said outer and inner conical rotating members or said two chamfered extremities of said chamfered rollers respectively in contact with said circular frustum surfaces of said outer and inner conical rotating members;
(d) means for preventing said plurality of chamfered rollers from orbiting about the central axis of said outer and inner conical rotating members;
(e) means for maintaining said plurality of chamfered rollers on said common hypothetical plane perpendicular to the central axis of said outer and inner conical rotating members in said substantially axisymmetric pattern and for shifting said plurality of chamfered rollers in unison in a direction parallel to the central axis of said outer and inner conical rotating members; and
(f) means for connecting a power-input shaft to one of said outer and inner conical rotating members and a power-output shaft to another of said outer and inner conical rotating members.

4,499,782

TRANSMISSION UNITS OF THE TOROIDAL RACE ROLLING FRICTION TYPE

Forbes G. D. Perry, Charlbury, England, assignor to National Research Development Corporation, London, England

Filed Sep. 28, 1982, Ser. No. 426,127
Claims priority, application United Kingdom, Oct. 5, 1981, 8130049
Int. Cl.[3] F16H *15/00, 15/16, 15/08*
U.S. Cl. 74—200 7 Claims



1. A toroidal race rolling friction transmission unit comprising:
at least one input disc;
at least one output disc;

a first roller, and a plurality of further rollers, providing a driving connection between said input and output discs;

first ratio-changing means including a mechanical linkage exhibiting mechanical advantage, connected to said first roller to impart precise increments of tangential shift to said first roller to cause said first roller to change ratio angle;

a member to sense the reaction force to which said first roller is subjected in the course of transmitting torque from said input disc to said output disc;

second ratio-changing means including first fluid-pressure-operated linear actuators connected to at least some of said further rollers, each line of action of a said actuator being aligned with the direction of tangential shift of its connected said roller, whereby to impart tangential shift to said further rollers so that they also change ratio angle, and operative connections between said fluid-pressure-operated actuators and said reaction force sensing member, whereby said actuators act upon said further rollers with a force matching said reaction force of said first roller.

4,499,783

TAPE RECORDING MACHINE

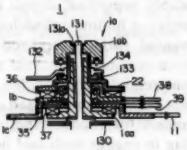
Kaoru Takemasa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 4, 1982, Ser. No. 336,994

Claims priority, application Japan, Jan. 7, 1981, 56-716[U]; Jan. 7, 1981, 56-891

Int. Cl.³ H04N 9/16; F16H 57/00, 37/06

U.S. Cl. 74—411 **13 Claims**



1. In a tape machine including at least one reel shaft unit having an upper portion for engaging a cassette reel and drive means for providing a rotational force to said shaft unit, the improvement characterized in that said shaft unit comprises:

a first pinion gear connected to said driving means;

a second pinion gear connected to said driving means;

a first flange member;

a second flange member coaxial with said first flange member;

a first rotational torque transmission gear for receiving said rotational force from said first or said second pinion gear and coaxial with respect to said flange units and disposed therebetween;

a second rotational torque transmission gear, for receiving said rotational force from said first pinion gear, coaxial with said flange units and disposed between said first gear and said second flange unit, said second gear being rotatable relative to said first gear;

spring means between said first and second gears for urging said first and second gears into frictional engagement with said first and second flange members, respectively; and

means for selecting whether said first or said second pinion gear is connected to said first and second transmission gears.

4,499,784

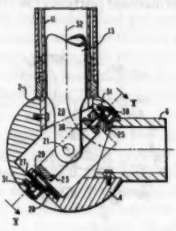
SPLIT-BALL TYPE WRIST AND MANIPULATING ASSEMBLY FOR ROBOT

Lanson Y. Shum, Salem Twp., Westmorelnd County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 20, 1981, Ser. No. 323,640

Int. Cl.³ G05G 11/00

U.S. Cl. 74—479 **2 Claims**



1. In a split-ball type wrist and manipulator assembly at one end of an arm, the assembly including at least a first ball portion and a second ball portion rotatably carried by the first ball portion, and an end effector carried by said second ball portion, the improvement comprising:

first hollow means fixedly connected to said first ball portion for rotation thereof;

second means disposed interiorly of said first hollow means and including means connecting it to said second ball portion to rotate said second ball portion relative to and independently of rotation of said first ball portion;

physically solid, flexible line means to power said end effector;

said first hollow means and split-ball wrist both defining interior hollow spaces adequate to accommodate both said second means and said connecting means thereof;

said line means extending through said hollow spaces to said end effector so that all of said powering line means are interiorly of said arm and wrist;

said second means comprises a hollow tubular member extending through said first hollow means and having said line means extending in said hollow tubular member; and

said connecting means of said second means includes an inner and an outer ring attached to each other along one diametral axis, the outer ring being attached to said second ball portion to effect rotation thereof in accordance with rotation of said outer ring, and said tubular member includes an end in said wrist and pivotally connected to said inner ring along another diametral axis perpendicular to said one diametral axis so that said rings are in gimballed relation.

4,499,785

MOLDED BALL SOCKET TERMINAL (CONNECTING BELTS)

William G. Bennett, Troy, and Arthur L. Spease, Livonia, both of Mich., assignors to Teleflex Incorporated, Limerick, Pa.

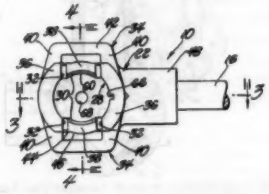
Filed Jun. 28, 1982, Ser. No. 392,516

Int. Cl.³ F16C 1/14

U.S. Cl. 74—501 R **11 Claims**

1. A motion transmitting remote control assembly (10) for transmitting motion in a curved path, said assembly (10) comprising: guide means (11); core means (16) movably supported by said guide means (11) and extending therefrom to provide a variable extending length of said core means (16) between said guide means (11) and one end (18) of said core means (16); and an integral terminal member (22) disposed on said extended length for operatively interconnecting said core means (16) and a control member (24), said terminal member (22) including a pocket (28) defining an axis and retaining means (30) for

retaining a portion of the control member (24) within said pocket (28) and a plurality of slots (32) extending from said pocket (28) substantially to the outer surface of said terminal member (22) and being parallel to said axis so as to divide said terminal member (22) into a plurality of portions (36,38) and characterized by said terminal member (22) including integral belt means (34) connecting at least two of said portions (36,38) for restraining the outward flexure of said connected portion (36,38), said terminal member including two outward portions (36) and two intermediate portions (38) therebetween, said belt



means (34) including at least one belt (34) extending between and interconnecting said outward portions (36) disposed on oppposite sides of one of said intermediate portions (38) said belt means (34) extending across said slots (32) on either side of said intermediate portion (38), said intermediate portion (38) having an outer surface and said belt means including first sections (40) extending from said outward portions (36) and an elongated second section (42) extending therebetween and spaced from said outer surface of said intermediate portion (38).

4,499,786

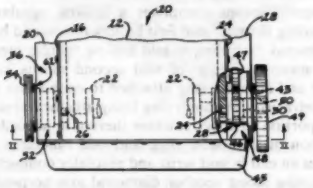
COUPLING OF DRIVING MEMBER TO DRIVEN MEMBER

Benny Ballheimer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 7, 1982, Ser. No. 385,364

Int. Cl.³ F02F 7/00

U.S. Cl. 74—606 R **5 Claims**



1. An apparatus including a prime mover (10) having a housing (12) with an end portion (14), an end cover (18) defining an opening (43) and being connected to the end portion (14) of the housing (12), a driving shaft (22) mounted in the housing (12) for providing output power from the prime mover (10) and having an end (30) terminating inside the end cover (18), a driven member (49) mounted outside the end cover (18), and means (48) for coupling the driven member (49) to the driving shaft (22) through the opening (43) and for selectively releasing the driving shaft (22) from the driven member (49) to enable removal of the driving shaft (22) without removing the end cover (18), comprising:

the driving shaft (22) having a flange and an outer cylindrical surface (34) adjacent the end, the diameter of said outer cylindrical surface (34) being smaller than the diameter of the flange (32), said coupling means (48) including a pilot member (62) having a bore (66) slideably mounted on the outer cylindrical surface (34) of the driving shaft (22) and a concentric outer cylindrical surface (68) extending through the opening (43) of the end cover (18), and including means (51) for drivingly securing the driven member (49) and the pilot member (62) to the flange (32) of the driving shaft (22).

4,499,787

ROTARY DRIVE TRANSMISSION MECHANISM ESPECIALLY FOR MOTOR VEHICLES

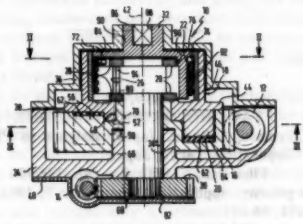
Rolf Leistner, Munich, and Herbert Becker, Coburg, both of Fed. Rep. of Germany, assignors to Brose Fahrzeugteile GmbH und Co., Munich, Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 373,271

Claims priority, application Fed. Rep. of Germany, May 11, 1981, 3118634

Int. Cl.³ F16H 35/00; E05F 15/00; F16D 21/02

U.S. Cl. 74—625 **14 Claims**

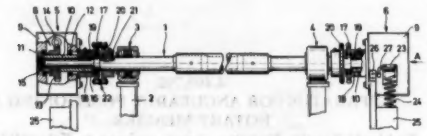


1. Drive transmission apparatus especially suitable for use in motor vehicles comprising: a rotatably supported driving member; a rotatably supported driven member coaxial with said driving member; a hollow cylindrical element defining an inner circumferential surface arranged coaxially with said driving and driven members; a helical spring braced against said inner circumferential surface within said hollow cylindrical element; a first claw member affixed on one of said driving and driven members for rotation therewith; said first claw member operating to engage with said helical spring to effect expansion of said spring when said first claw member is rotated relative to said spring; said hollow cylindrical element being rigidly connected for rotation with the other of said driving and driven members; a disengaging element adapted to be connected with an auxiliary drive apparatus rotatably supported coaxially with said driving and driven members and having a second claw member formed thereon; said second claw member being operative upon corresponding mutual rotation between said helical spring and said disengaging element to engage said helical spring to effect reduction of the diameter thereof; said helical spring comprising a pair of radially extending ends with said first claw member engaging one of said ends depending upon the relative direction of rotation between said helical spring and said first claw member in order to effect expansion of said helical spring; said second claw member engaging against the other of said ends of said helical spring depending upon the direction of relative rotation between said second claw member and said helical spring in order to operate to reduce the diameter of said helical spring; said disengaging element being constructed with a partial cylindrical member extending therefrom which forms said second claw member and which is radially disposed between said helical spring and said driven member; said partial cylindrical member extending into said helical spring and having edges thereon which extend in an axial direction and which interact with said ends of said helical spring.

4,499,788
FEEDING DEVICE HAVING ALTERNATIVELY CONNECTABLE SLIP-ON GEAR UNITS

Gerhard Obenland, Ilsfeld, Fed. Rep. of Germany, assignor to Dürr Automation + Fördertechnik GmbH, Fed. Rep. of Germany

Filed Jul. 27, 1982, Ser. No. 402,297
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130300
Int. Cl.³ F16H *37/00*
U.S. Cl. 74—661 7 Claims

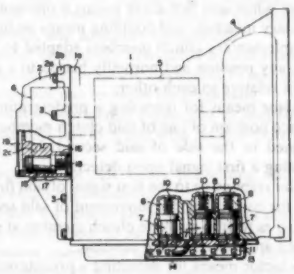


1. Feeding device comprising a frame, a drive shaft (1) having two ends and two gear units (8) each drivable by a motor, which gear units are able to be connected alternately to the drive shaft such that each may rotate with said drive shaft independently of the other, characterized in that the two gear units are designed as slip-on gear units each having a driven hollow shaft (10), the two ends of the drive shaft (1) each have the hollow shaft (10) of one of the two slip-on gear units mounted around them in a manner permitting relative rotation, the gear units are secured against rotation about the axis of rotation defined by the drive shaft (1), and a rotary couple (17, 20, 22) is provided, such that one of the hollow shafts (10) at a time is connected to the drive shaft (1) whereby the hollow shaft may rotate therewith.

4,499,789
AUTOMATIC TRANSMISSION WITH OVERDRIVE HOUSING INCLUDING ITS OWN ACCUMULATOR

Koujiro Kuramochi, and Tokuyuki Takahashi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 28, 1982, Ser. No. 425,260
Claims priority, application Japan, Jun. 3, 1982, 57-95736
Int. Cl.³ F16H *37/04, 57/02*
U.S. Cl. 74—740 2 Claims

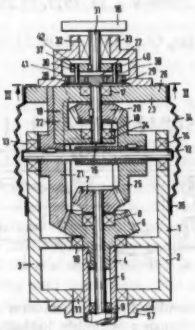


1. An automatic transmission, comprising:
(a) a transaxle casing;
(b) an overdrive casing constructed separately and assembled together with said transaxle casing;
(c) a gear transmission mechanism housed within said transaxle casing, comprising a first hydraulic fluid pressure actuated friction engaging mechanism, and selectable between a plurality of speed stages according to selective supply of hydraulic fluid pressure to said first hydraulic fluid pressure actuated friction engaging mechanism; said gear transmission mechanism receiving a supply of rotational power, modifying said rotational power according to its selected speed stage, and then outputting modified rotational power;
(d) an overdrive mechanism housed within said overdrive casing and drivingly interconnected with said transmission mechanism, comprising a second hydraulic fluid pressure actuated friction engaging mechanism, and selectable between a plurality of speed stages according to selective supply of hydraulic fluid pressure to said second hydraulic fluid pressure actuated friction engaging mechanism; said overdrive mechanism receiving supply of rotational power, modifying said rotational power according to its selected speed stage, and then outputting modified rotational power;
(e) a first control mechanism for said gear transmission mechanism, which selectively supplies hydraulic fluid pressure for actuating said first hydraulic fluid pressure actuated friction engaging mechanism for selecting said gear transmission mechanism to various ones of its speed stages, comprising a first hydraulic fluid accumulator for moderating sudden pressure changes within a part of said first control mechanism, said first hydraulic fluid accumulator being incorporated in said transaxle casing; and
(f) a second control mechanism for said overdrive mechanism, which selectively supplies hydraulic fluid pressure for actuating said second hydraulic fluid pressure actuated friction engaging mechanism for selecting said overdrive mechanism to various ones of its speed stages, comprising a second hydraulic fluid accumulator separate from said first hydraulic fluid accumulator for moderating sudden pressure changes within a part of said second control mechanism, said second hydraulic fluid accumulator being incorporated in said overdrive casing.

4,499,790
SWIVEL HEAD FOR INDUSTRIAL ROBOTS

Dirk Helms, Ahrensburg, Fed. Rep. of Germany, assignor to Fa.Jungheinrich Unternehmensverwaltung KG, Hamburg, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,035
Claims priority, application Fed. Rep. of Germany, May 22, 1982, 3219292
Int. Cl.³ F16H *37/06, 1/14;* G05G *11/00;* B25H *9/00*
U.S. Cl. 74—665 C 22 Claims



1. A swivel head for industrial robots, which swivel head has two degrees of freedom, comprising
a rigid housing having a rear end portion, a front end portion, and a side wall portion extending between said rear end portion and said front end portion,
first bearing means mounted in said housing adjacent to said rear end portion,
second bearing means which are mounted in said side wall

portion of said housing spaced from said first bearing means closer to said front end portion and comprise spaced apart bearings centered on an axis which intersects and traverses the axis of said first bearing means at right angles thereto,

a first shaft extending centrally into said housing through said rear end portion and rotatably mounted in said first bearing means,

a second shaft extending into said housing through said rear end portion,

third bearing means disposed between said first and second shafts,

a first spindle, which is rotatably mounted in said second bearing means,

first transmitting means operatively connecting said first shaft and said first spindle and comprising a swiveling bevel gear, which is non-rotatably connected to said first spindle, said swiveling bevel gear located at least in part within said rigid housing,

a bearing bracket carried by said swiveling bevel gear and located spaced outwardly from the front end portion of said rigid housing,

a second spindle, which is rotatably mounted in said bearing bracket and extends out of said front end portion of said housing,

second transmitting means which operatively connect said second shaft to said second spindle and are operable to rotate the latter,

a bearing carrier mounted on said bearing bracket spaced outwardly from the front end portion of said housing,

fourth bearing means which are coaxial to said second spindle and mounted in said bearing carrier,

a tool carrier shaft, which is rotatably mounted in said fourth bearing means, and

a speed-reducing transmission which has a high reduction ratio and operatively connects said second spindle to said tool carrier shaft to drive the latter.

4,499,791

AUTOMOTIVE VEHICLE DRIVE TRAIN

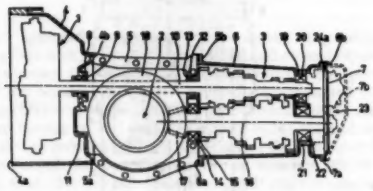
Roger Brisabois, Clamart, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Division of Ser. No. 939,316, Sep. 5, 1978, Pat. No. 4,308,763, which is a continuation-in-part of Ser. No. 873,575, Jan. 30, 1978, Pat. No. 4,289,045. This application Apr. 15, 1981, Ser. No. 254,340

Claims priority, application France, Jan. 31, 1977, 77 02560; Sep. 14, 1977, 77 27809; Sep. 14, 1977, 77 27811; Sep. 14, 1977, 77 27810

Int. Cl.³ F16H *37/08, 57/02*

U.S. Cl. 74—700 **12 Claims**



1. A housing assembly for a transmission unit in an automotive vehicle, said housing assembly including a first housing and a second housing, said first housing having first and second faces located at its opposite ends, said first face being connectible to an engine housing, said first housing having space between said faces capable of receiving a power transmitting means comprising a manual clutch, said space also being capable of receiving a power transmitting means comprising a hydrokinetic torque converter,

a partition wall which is located near said second face and is provided with a hole which permits a transmission input shaft from a power transmitting means to pass therethrough,

first bearing support means on the partition wall for supporting a shaft which passes through the hole, and

second bearing support means on the partition wall for supporting an output shaft of a manual shift gearbox.

4,499,792

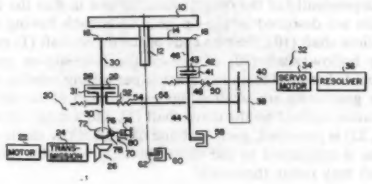
APPARATUS FOR ANGULARLY POSITIONING A ROTARY MEMBER

Toshiyuki Tanabe, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,846

Int. Cl.³ B23B *29/24*

U.S. Cl. 74—825 **6 Claims**



1. An apparatus for angularly positioning a rotary member, comprising:

first drive means connectible to rotate said rotary member in a work operation;

power transmission means operable to connect said first drive means with said rotary member for rotating said rotary member in a work operation;

second drive means connectible to rotate said rotary member in an angular positioning movement;

coupling means actuatable to connect said second drive means to said rotary member for rotating said rotary member while said first drive means is disconnected from said rotary member, said coupling means including a pair of complementary clutch members adapted to be engageable at any position and normally biased to a disengaged position relative to each other;

first detector means for detecting a predetermined angular reference position of one of said clutch members which is positioned to the side of said second drive means and generating a first signal upon detection;

a controller responsive to the first signal of said first detector means for controlling the movement of said second drive means so as to stop said one clutch member at said predetermined angular reference position;

second detector means for detecting a predetermined angular reference position of said rotary member, said second detector means being operated by the rotary movement of said rotary member when said rotary member approches to said predetermined angular reference position thereof and generating a second signal upon detection; and

means responsive to the second signal of said second detec tor means for stopping said rotary member at said predetermined angular reference position thereof;

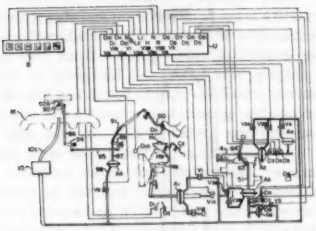
said controller sequentially rendering said coupling means engaged after effecting stoppage of said rotary member at said predetermined angular reference position thereof.

4,499,793

AUTOMATIC GEAR SHIFTING DEVICE

Long S. Jow, and Long J. Jow, both of Taipei, Taiwan, assignors to Transtech Industrial Corporation, Taipei, Taiwan

Filed Nov. 4, 1981, Ser. No. 318,210
Int. Cl.[3] B60K *41/18, 41/04*
U.S. Cl. 74—866 9 Claims



1. An automatic gear shifting device for use in an automobile, comprising:

a transmission having gears assembled to be selectively shifted by a shift rod to transmit power from an engine to a drive axle of an automobile at a predetermined gear ratio and having a plurality of transmission gear positions each achieving a specific gear ratio, said shift rod having a longitudinal axis and being capable of moving longitudinally to perform the shifting of the gears and rotating with respect to the longitudinal axis to perform gear selection;

a clutch device operable with a release collar and capable of engaging to transmit and disengaging to interrupt power from the engine to said transmission;

detectors for detecting engine speed, automobile road speed, transmission gear position, clutch position, and for delivering electrical control signals responsive to engine speed, road speed, transmission gear position and clutch position;

a trigger switch operable by an accelerator pedal;

actuators operable by a working means for operating said shift rod of said transmission, engaging and disengaging of said clutch device, and opening and closing of a throttle valve of the automobile, said actuators comprising:

a first actuator operatively connected to said release collar;

a second actuator operatively connected to said shift rod to cause said shift rod to move longitudinally;

a third actuator operatively connected to said shift rod to cause said shift rod to rotate with respect to its longitudinal axis;

a fourth actuator for selectively preventing said shift rod from moving longitudinally;

a fifth actuator for selectively preventing said shift rod from rotating with respect to its longitudinal axis; and

a sixth actuator operatively connected to the throttle valve;

valve means operable by electrical operation signals for admitting and interrupting said working means to said actuators; and

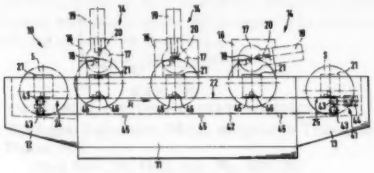
a control unit adapted to receive said electrical control signals and produce electrical operation signals in response to said electrical control signals in accordance with a program to cause said valve means to operate so that the actuators and consequently the throttle valve, clutch device and transmission operate in association with each other to change the gear ratio to meet the driving speed and load condition of the automobile.

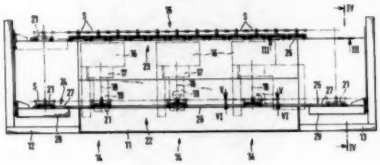
4,499,794

MACHINE FOR MACHINING CIRCULAR SAW BLADES

Ernst Beck, Maselheim; Peter Lenard, Biberach an der Riss, and Erich Pokorny, Schemmerhofen, all of Fed. Rep. of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Fed. Rep. of Germany

Division of Ser. No. 331,210, Dec. 16, 1981, Pat. No. 4,449,427.
This application Mar. 19, 1984, Ser. No. 590,985
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048738; Dec. 23, 1980, 3048739
Int. Cl.[3] B23D *63/14*
U.S. Cl. 76—75 8 Claims





1. In a transport device for workpieces which have to pass a plurality of machining stations (14) arranged in a row, comprising

a number of workpiece carriages (21) which exceeds the number of stations (14),

a work path (22) extending through the machining stations (14),

an endless conveyor (41) which moves the workpiece carriages (21) along said work path (22), step by step, from station to station, and which has attachments (45) located at equal distances, to which, at each workpiece carriage (21), there is a member (46) mating with the attachments,

a return path (23), and

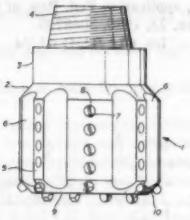
two transverse carriages (28, 29), by which the workpiece carriages (21) can be transferred between said work path (22) and said return path (23), the improvement wherein that one branch path (24 and 25, respectively), each, is arranged on the transverse carriages (28, 29), said branch path following alternately the work path (22) and the return path (23), according to the position of the respective transverse carriage, that the endless conveyor (41) extends beyond the work path (22) along the branch paths (24, 25) following said work path, that one branch path (25) is adapted to be reciprocated between the end of the work path (22) and the start of the return path (23) and has a shifting means (51) by which, in each case, one workpiece carriage (21) can be shifted from said branch path (25) to the return path (23), and that the workpiece carriages (21) have stops (47, 48) with which they abut against each other on the return path (23) and maintain spacings between each other that are smaller than the distances between the attachments (45) of the endless conveyor (41).

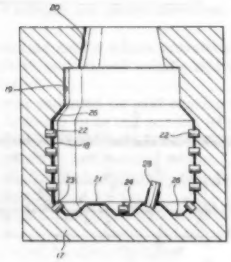
4,499,795

METHOD OF DRILL BIT MANUFACTURE

Robert P. Radtke, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Filed Sep. 23, 1983, Ser. No. 535,321
Int. Cl.³ E21B *9/36*; B22D *19/02*
U.S. Cl. 76—108 A **22 Claims**





1. A method of producing a drill bit component adapted to receive a plurality of hardmetal inserts positioned in recesses therein, which comprises

providing a refractory mold having an internal surface corresponding closely to the external shape of a finished drill bit component and having a plurality of relatively soft metal plugs protruding from the walls thereof in locations corresponding to the recesses in the bit component in which said inserts are to be positioned,

supporting a coating of sintered refractory metal particles on selected portions of the inner surface of said mold including the locations where said soft metal plugs are positioned,

melting a metal and heating the same above the melting point of the matrix metal of said refractory metal particles,

casting said molten metal into said mold in contact with said refractory metal particles to produce some desintering of said particles and produce a casting having a composite structure with selected portions of the surface being coated with said particles for a substantial depth and with said soft metal plugs extending through said coating,

removing said casting from said mold,

drilling out said metal plugs from said casting to produce recesses in said bit component sized to receive said inserts, and

placing said inserts in said drilled recesses.

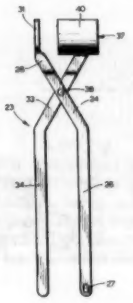
4,499,796

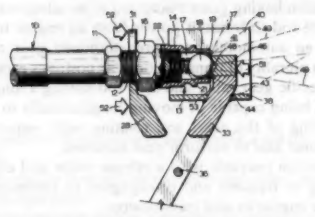
FLUID PRESSURE RELEASING TOOL

Jon L. Miller, Star Rte. B, Rosseau, Minn. 56751

Filed Aug. 29, 1983, Ser. No. 527,249
Int. Cl.³ B25B *7/00*
U.S. Cl. 81—5.1 R **34 Claims**

1. A tool for releasing fluid pressure in a means for accommodating fluid under pressure, said means having a normally closed check valve, said check valve being movable to an open position to allow fluid under pressure to flow from said means thereby reducing the fluid pressure therein, comprising: first lever means having a yoke adapted to engage a portion of the means for accommodating fluid under pressure, second lever means having a projection adapted to engage the check valve, pivot means connecting the first and second lever means to allow the yoke and projection to selectively have relative movement toward and away from each other, said yoke and





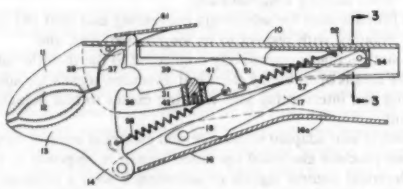
projection, when moved toward each other, causes the check valve to move to the open position thereby allowing the fluid under pressure in the means accommodating fluid under pressure to flow therefrom, and shield means mounted on the second lever means adjacent the projection for controlling the direction of flow of fluid discharged from the means accommodating fluid under pressure when the check valve is moved to the open position.

4,499,797

SELF-ADJUSTING LOCKING WRENCH

Neill R. Wilson, P.O. Box 538, Berryville, Va. 22611

Filed Nov. 19, 1982, Ser. No. 443,135
Int. Cl.³ B25B *7/12*
U.S. Cl. 81—367 **14 Claims**



2. A locking type wrench comprising:

an elongated first handle provided with an integral fixed upper jaw at a forward end thereof;

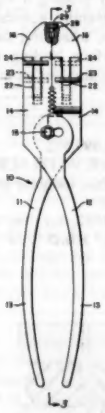
a cam member pivotally mounted on said first handle;
a movable bar adapted to slide against a surface of said first handle and positioned rearwardly of said upper jaw;
a movable lower jaw cooperable with said upper jaw and pivotable against said cam member, said upper and lower jaws having opposed gripping faces adapted to grip an associated object;
resilient means adapted to urge said lower jaw away from said upper jaw;
a second handle pivotally secured to said lower jaw and forming a first toggle link in a toggle joint;
a second toggle link pivotally engaged at a first end with said second handle and at a second end with said movable bar, said two handles being movable toward each other in order to bring said two jaws into a gripping engagement with said associated object, continued movement of said handles toward each other causing said second toggle link to slide said movable bar along said first handle surface away from said upper jaw; and,
cam actuating means for rotating said cam member with respect to said first handle while said handles are being moved toward each other until said cam member contacts said movable bar to prevent it from sliding further, continued movement of said handles actuating said toggle joint to an over-center condition to lock the wrench on said associated object.

4,499,798

REMOVABLE CAP MEMBERS FOR PLIERS

Leonard A. Miskiewicz, 219 Sprucewood St., Pittsburgh, Pa. 15210

Filed May 9, 1983, Ser. No. 492,649
Int. Cl.³ B25B *7/02*
U.S. Cl. 81—423 **2 Claims**



1. In combination with pliers having a pair of plier elements pivotally connected at a pivot axis adjacent their mid-regions and each having a jaw at one end and a handle at the other end, said jaws being opposed and arranged to provide for clamping of an interposed workpiece, said handles being opposed and arranged to be closed together to close said jaws together, each said jaw having opposed sides and a cap-receiving portion which includes a slot extending in the direction which is parallel to the pivot axis of the pliers and which extends from an open end adjacent a forward end of said jaws to a base spaced from said open end; a pair of rods secured to each jaw one on each side thereof, said rods extending across said respective slot, the rods on each jaw being parallel and being spaced at different distances from the said pivot axis;
an arcuate recess extending in each jaw from said base of said slot along a circular arc centered on one of said rods;
a pair of cap members, each having a working face at its forward end and a tongue which extends away from said working face and generally parallel thereto, each said tongue having a thickness corresponding to the width of a respective said slot and having an arcuate finger-like projection adapted to enter the respective said arcuate recess; each said tongue having opposed sides and a pair of spaced-apart parallel grooves are on each side thereof, each grooves being adapted to engage a respective one of the said rods when the said finger-like projection is engaged in said arcuate recess
whereby a pair of said cap members are cooperable with said cap-receiving portions to be selectively assembled on said pliers jaws with said working faces opposed to cooperate in carrying out a work function.

4,499,799

INTERNAL GRIPPING PIPE WRENCH

John W. Bordages, Lakeshore, Miss., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 25, 1983, Ser. No. 555,233
Int. Cl.³ B25B *15/00*
U.S. Cl. 81—446 **2 Claims**

1. Inside gripping pipe wrench, comprising
a flat cylindrical unit adapted for insertion into a pipe to apply torque thereto by contact with its inside surface,
said unit being symmetrical whereby it can torque said pipe either way depending upon which face is inserted first,
said unit comprising a rotor having an axially concentric flat sided socket extending therethrough,
concentric annular means surrounding said rotor,
a plurality of toothed gripping means spaced circumferentially about said annular means
each said gripping mens comprising an arcuate arm pivotally mounted on said annular means and having teeth at the free end relative to said annular means,
a plurality of links for interconnecting said free ends of said arcuate arms with said rotor, and
means for mounting said links pivotally at both ends,
said links being longer than the radial distance from said rotor to said annular means whereby relative rotation of said rotor inside said annular means will extend said gripping means to make said contact with the pipe.

4,499,800

TOOL HOLDER CLAMPING MEANS

Gunther R. Stahl, Canoga Park, Calif., assignor to General Electric Company, Detroit, Mich.

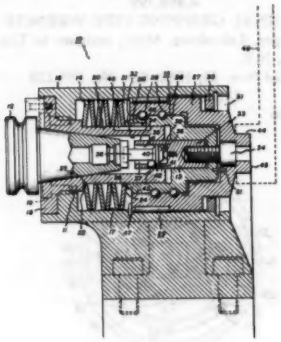
Filed Apr. 4, 1983, Ser. No. 481,548
Int. Cl.³ B23B *29/00, 31/00, 5/22, 5/34*
U.S. Cl. 82—36 R **3 Claims**

1. A tool holder locking means comprising in combination:
(a) a housing adapted to be securely fixed to a machine tool and having a bore therein;
(b) a hollow tapered tool holder insert in said bore for receiving a tool holder, said insert having a face end abut-

ting said housing and having a hollow cylindrical projection positioned concentrically in said bore and defining an annular space therebetween;

(c) a ball thread device comprising inner and outer nesting cup shaped races positioned concentrically in said bore adjacent said insert and with the outer race constrained from axial motion, said inner and outer races having complementary thread grooves on their adjacent surfaces having a plurality of drive balls therein whereby rotation of said outer race drives said inner race axially;

(d) a hollow cylindrical coupling member affixed to said inner race and extending into the hollow cylindrical projection of said insert in coaxial relationship, said coupling member having means for axial reciprocating motion therein, said coupling member having a transverse aperture therein adjacent its inner end, a ball means loosely fitting in said aperture and adapted to occupy a first low position where the ball means rests on the bore of the



insert while remaining in said aperture, and to occupy a second elevated position by means of a step shoulder on the end of said insert which underlies said aperture when the coupler is moved axially in one position;

(e) a detent member affixed to said insert and coaxially projecting into said coupling member and engaging said ball means to be retained thereby;

(f) spring means in said housing bore and coaxially positioned in said annular space between said insert projection and said housing bore, said spring means engaging said insert at one end and engaging said inner race at the outer end; and (g) drive means on said outer race and adapted to rotate said outer race so that said inner race moves axially to compress said spring means while at the same time moving said coupling member axially so that said detent ball drops in its aperture to permit withdrawal of said detent from said coupling means and said tool holder from said insert.

4,499,801

WEB SLITTING AND GROOVING METHOD

Imants Reba, Vancouver, Wash.; Rudolph W. Schutz, Walnut Creek, and Nestor Kozbur, Antioch, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Division of Ser. No. 422,319, Sep. 23, 1982, Pat. No. 4,484,500. This application Apr. 23, 1984, Ser. No. 602,886

Int. Cl.³ B26D *3/08*

U.S. Cl. 83—24 **3 Claims**

1. In a method of making a spirally wound paper roll product having a bearing wall formed by the convolutions of the roll product, the steps of:

transporting a parent web along a predetermined path of movement;

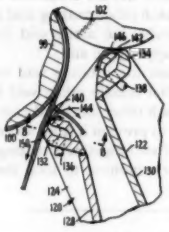
at a first location along said path of movement, performing a first slitting operation on said parent web to form lines of cut therein and divide said parent web into separate web segments;

at a second location downstream from said first location, performing a second slitting operation on said parent web segments along lines of cut;

periodically moving at least one of said slitting operations transversely relative to said parent web so that portions of at least some lines of (f) cut are of set and out of registry periodically so that trim segments are formed;

inducing a fluid flow closely adjacent to said second location;

removing said trim segments from the remainder of said parent web at said second location by entraining said trim segments in said fluid; and



exerting forces on said parent web to manipulate said parent web and facilitate removal of said trim segments from the remainder of said parent web by providing pressure against said parent web at oppositely disposed positions across said trim segments and spaced therefrom while said trim segments are entrained in said fluid flow, said fluid flow being induced by passing a high speed fluid flow through a restricted opening generally located between said pressure positions, attaching said high speed fluid flow to a Coanda surface leading from said restricted opening, and entraining ambient air in the direction of said Coanda surface.

4,499,802

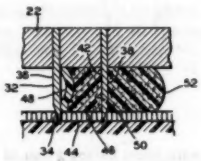
ROTARY CUTTING DIE WITH SCRAP EJECTION

Jack R. Simpson, Toledo, Ohio, assignor to Container Graphics Corporation, Toledo, Ohio

Filed Sep. 29, 1982, Ser. No. 426,866

Int. Cl.³ B26D *7/18*

U.S. Cl. 83—117 **16 Claims**



1. In a cutting die, a die plate, a first cutting rule portion extending upwardly from said die plate and having a first cutting edge spaced a uniform distance above said die plate over the length of said cutting rule portion, a second cutting rule portion extending upwardly from said die plate, having a second cutting edge spaced a uniform distance above said die plate over the length of said second cutting rule portion, and spaced from said first cutting rule portion, a first resilient ejection strip between said cutting rule portions, located adjacent said first cutting rule portion, and extending upwardly at least to the height of the first cutting edge, and a second resil-

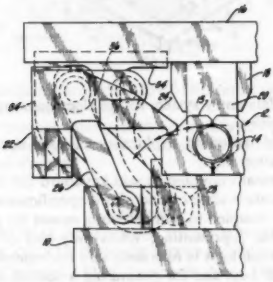
ient ejection strip between said cutting rule portions, located adjacent said second cutting rule portion, and extending upwardly to a height not exceeding the height of said first ejection strip, said second ejection strip being softer than said first ejection strip to apply an asymmetrical ejection force to material between said first and said second cutting rule portions.

4,499,803

DOUBLE CUT DIE SET WITH IMPROVED PULL-ACROSS NOTCHING FEATURE

John J. Borzym, Birmingham, and Alexander Borzym, West Bloomfield Township, Ingham County, both of Mich., assignors to Alpha Industries, Inc., Novi, Mich.

Filed Oct. 7, 1983, Ser. No. 539,807
Int. Cl.³ B23D *21/00*; B26D *3/16*
U.S. Cl. 83—319 **11 Claims**



1. A tube shearing apparatus of the type wherein a first blade is drawn across the tube to notch a wall section and a second blade is thereinafter driven through the tube using the notched section as an entry point, wherein the improvement comprises:

a base;

an upper platen assembly reciprocally movable relative to the base and adapted to carry the second blade;

a support carriage for the first blade;

a pair of parallelogram links interconnecting the base and the blade support carriage to control the relative motion therebetween so as to define an arcuate path of travel for the first blade which extends across the tube section and thereafter arcuately away from the tube section and toward the base; and

drive means interconnecting the upper platen assembly and the blade support carriage for driving the blade support carriage along said arcuate path of travel as the upper platen assembly moves toward the base.

4,499,804

SAFETY DEVICE FOR A MEAT SLICER

Mutsumi Takeda, Fukushima, Japan, assignor to Hitachi Koki Haramachi Works, Ltd., Ibaraki, Japan

Filed Mar. 15, 1983, Ser. No. 475,654
Claims priority, application Japan, Mar. 16, 1982, 57-37597[U]
Int. Cl.³ B26D *7/24*
U.S. Cl. 83—399 **6 Claims**

1. In a meat slicer including a circular blade supported rotatably at one end of a table, a meat box for carrying a lump of meat therein, and reciprocally movable to and away from said blade along rails provided on said table, and a holding plate supported removably on said table adjacent to said blade, and movably in the direction in which said meat box is reciprocally movable, a safety device, comprising:

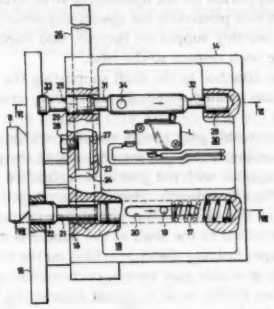
a lock pin slidably fitted in a first blind hole formed horizontally in said table;

a spring disposed in said first blind hole between a bottom of said first blind hole and said lock pin for urging said lock pin toward an open end of said first blind hole so that said lock pin may extend flush with said open end;

a guide bar secured to said holding plate and having a portion received in said first blind hole;

said table having a second blind hole which is connected with said first blind hole;

a lock bar slidably received in said second hole and having an engaging portion at its inner end which confronts said



first blind hole for selectively engaging said portion of said guide bar, said lock bar further having a first reducing diameter portion adjacent to its outer end;

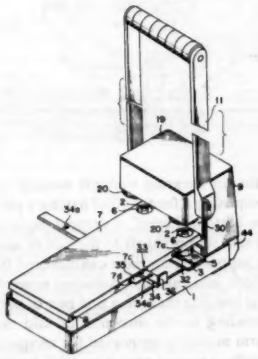
an actuator slidably received in a third blind hole which is connected to said second hole, said actuator having a reduced diameter portion engageable with said first reduced diameter portion of said lock bar, and a first switch L engaged with said actuator and controlled thereby for controlling a driving circuit for said slicer.

4,499,805

PUNCH FOR OFFICE USE

Chuzo Mori, Katsushika, Japan, assignor to Carl Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 393,890
Int. Cl.³ B26F *1/02*
U.S. Cl. 83—468 **12 Claims**



1. A punch for office use comprising:

a base, having a tip end side and a rear end side,

a hollow upstanding structural member provided at the tip end side of the base and having a gap portion from the base at its side corresponding to the side of the rear end of the base,

a pair of stationary cylindrical piercing blades upstandingly

provided on and fixedly secured to the base forming the gap portion,

a base plate for placing a thick stack of sheets of paper to be pierced thereon having one end pivoted at the rear end side of the base, the other end having holes for receiving the pair of piercing blades,

spring means connected to the other end of the base plate and the hollow upstanding structural member to upwardly bias the base plate,

a handle supported on the upstanding structural member by a shaft which penetrates the upstanding structural member and is rotatably supported thereto, said handle rotatably movable with respect to the base,

gear means attached to the shaft supporting the handle, said gear means located within the upstanding structural member,

vertically movable gear means movable within a portion of the upstanding structural member above the gap portion, and engageable with the gear means attached to the shaft, said vertically movable gear means reciprocating with respect to the pair of piercing blades through the gear means attached to the shaft as the handle is moved, and

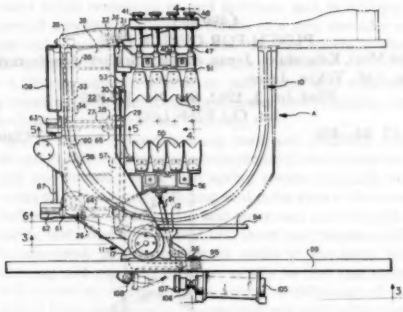
a pair of paper holding plates provided on the bottom of the vertically movable gear means, corresponding to the pair of piercing blades so as to thrust against the ends of the piercing blades.

4,499,806

MULTIPLE GOB SHEARING MECHANISM OPERATING IN A STRAIGHT LINE

Eustace H. Mumford, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 13, 1983, Ser. No. 541,815
Int. Cl.³ C03B *5/38*
U.S. Cl. 83—527 **13 Claims**



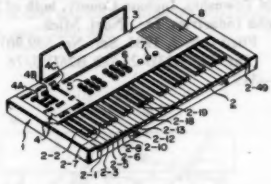
1. Apparatus for shearing multiple streams of molten glass into gobs, comprising a feeder bowl having a plurality of inline orifices in the bottom thereof, a vertical support shaft, means for mounting said support shaft to the side of said feeder bowl, a shear blade supporting carriage cantilevered from said vertical support shaft, said carriage extending normal to the line of said orifices, at one side thereof, a first pair of parallel, horizontal shafts extending in the direction of said carriage, a first shear blade arm movably supported for reciprocation on said first pair of shafts, a second pair of parallel, horizontal shafts in generally coaxial alignment with said first pair of shafts, a second shear blade arm movably supported for reciprocation on said second pair of shafts, means connected to said second pair of shafts for raising or lowering the axes of said second pair of shafts in unison, and drive means connected to said arms for moving said arms toward and away from each other to affect the shearing of the glass streams.

4,499,807

KEY DATA ENTRY SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

Hideaki Ishida, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 297,790, Aug. 31, 1981, abandoned. This application Jul. 22, 1983, Ser. No. 516,421
Claims priority, application Japan, Sep. 5, 1980, 55-123323; Sep. 5, 1980, 55-123324
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **16 Claims**



1. A key data entry system for an electronic musical instrument, comprising:

a keyboard including a plurality of user operable chord specification keys;

detecting means coupled to said keyboard for detecting the key operation state of said chord specification keys;

first means coupled to said detecting means for generating a first signal representing, when only one of said chord specification keys is operated, said one operated key as a particular key, and for generating a second signal representing the higher or highest note key as said particular key when plural chord specification keys are operated;

second means coupled to said detecting means for generating a third signal representing the number of chord specification keys operated at a time by the operator; and

chord designating means coupled to said first and second means and being responsive to one of said first and second signals for generating a signal representing the root note of a chord to be produced which is a function of said particular key, and being responsive to said third signal for generating a signal representing the type of the chord to be produced as a function of the number of said chord specification keys operated simultaneously, irregardless of which of said plurality of chord specification keys are operated.

4,499,808

ELECTRONIC MUSICAL INSTRUMENTS HAVING AUTOMATIC ENSEMBLE FUNCTION

Eiichiro Aoki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 469,956, Dec. 24, 1980, abandoned. This application Feb. 25, 1983, Ser. No. 469,956
Claims priority, application Japan, Dec. 28, 1979, 54-170939
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **27 Claims**

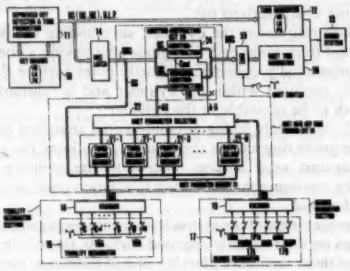
1. An electronic musical instrument of the type including a keyboard, and musical tone generating means for generating a musical tone corresponding to a depressed key of said keyboard, said depressed key being represented by certain depressed key information, said electronic musical instrument further comprising:

tonality designating means that designate the tonality of a musical piece to be performed independent of said depressed key information;

ensemble interval designating means for providing an ensemble interval designating information which determines an interval between the note of said depressed key and a note to be provided as an ensemble note;

ensemble tone data forming means for forming pitch data of

an ensemble note in accordance with the designated tonality, the ensemble interval designating information and said depressed key information, said pitch data representing a scale tone of the designated tonality which is spaced from the depressed key tone by an interval of a degree number



as is determined according to said ensemble interval designating information; and

ensemble musical tone generating means for generating a musical tone signal in accordance with the ensemble pitch data thus formed.

4,499,809

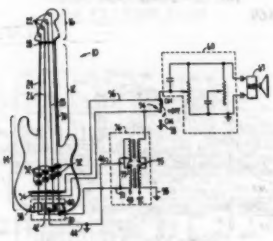
DUAL SIGNAL MAGNETIC PICKUP WITH EVEN RESPONSE OF STRINGS OF DIFFERENT DIAMETERS

Martin R. Clevinger, 5410 Telegraph Ave., Oakland, Calif. 94609

Continuation-in-part of Ser. No. 360,181, Mar. 22, 1982, Pat. No. 4,408,513. This application Jul. 11, 1983, Ser. No. 512,219

Int. Cl.³ G10H *3/18*

U.S. Cl. 84—1.15 **12 Claims**



1. Apparatus for use in a stringed musical instrument having a plurality of strings generally parallel to one another and lying within a string plane for converting string motion to electrical signals, comprising

step-up transformer means having a low impedance primary winding and a substantially higher impedance secondary winding;

a first combination of the strings from the plurality of strings connected in parallel and having a set of equivalent parameters including resistance, mass, permeability, reluctance and inductive reactance;

a second combination of the strings from the plurality of strings connected in parallel and having equivalent parameters including resistance, mass, permeability, reluctance and coercivity, the first and second combination of strings being each extended between a first node and a second node, the first and second combination of strings being electrically connected to one another at the first node so that the first combination is connected in series with the second combination, wherein the series connection of the first and second combinations is electrically connected at the second node across the primary winding of the step-up transformer, and further wherein the equivalent parameters of the first string combination are substantially the same as that for the second string combination; and

a plurality of means for supplying a magnetic field, each of which is associated with a different one of the plurality of strings, wherein each magnetic field supplying means include a first magnetic pole and a second opposite magnetic pole, and further wherein each of the magnetic field supplying means is positioned in close proximity to its associated string and so that the first magnetic pole and second magnetic pole thereof are positioned on opposite sides of the associated string.

4,499,810

OBTURATOR FOR FLUTE DESIGNED TO IMPROVE THE EMISSION OF CERTAIN NOTES

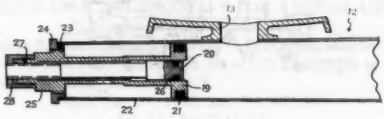
Ernest J. Ferron, 14, rue Massacre, 76000 Rouen, France

Filed Jun. 21, 1983, Ser. No. 506,218

Claims priority, application France, Jun. 23, 1982, 82 11000

Int. Cl.³ G10D *7/02*

U.S. Cl. 84—384 **16 Claims**



1. A flute having a cavity next to a mouthpiece hole, and an obturator for closing said cavity, said obturator defining a resonator chamber communicating with said cavity and including means for adjusting the size of said resonator chamber, to improve the emission of at least one particular note produced by the instrument.

4,499,811

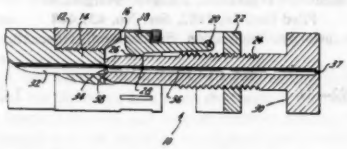
BANK FIRING ATTACHMENT INCLUDING PIVOTAL LOCKING LUGS

Robert P. Kaste, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 11, 1983, Ser. No. 540,237

Int. Cl.³ F41F *17/12*

U.S. Cl. 89—14.5 **4 Claims**



1. A blank firing attachment for gun tubes of automatic or semi-automatic weapons which comprises:

a flash suppressor having circumferentially disposed axial slots threadably attached to the gun tube end;

a shaft containing a passage for restricting gas flow from said gun tube;

a collar threadably attached to said shaft;

a plurality of locking lugs, each being pivotally connected at one end to said collar and having a lug for engagement to said axial slots;

a slidable cam means connected to each of said locking lugs and arranged to slide along said shaft to force said lugs to engage said slots,

whereby rotation of said shaft in said collar effects axial movement of said shaft to cause said lugs to engage said axial slots

and said shaft to engage said gun tube end, thereby restricting gas flow from said gun tube to provide sufficient back pressure to permit automatic and semi-automatic firing of the weapon when using blank ammunition.

4,499,812

SERVO-MOTOR FOR POWER-ASSISTED BRAKING

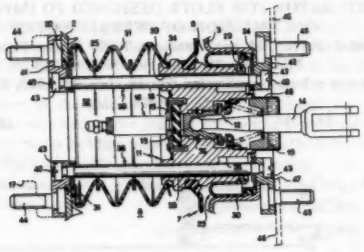
Pierre Pressaco, La Courneuve, and Jean-Jacques Carré, Le Raincy, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Oct. 7, 1983, Ser. No. 540,076

Claims priority, application France, Oct. 29, 1982, 82 18184

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—376 R **13 Claims**



1. A servo-motor for power-assisted braking, comprising a housing (1) having opposite end walls, a wall structure movable axially in said housing and dividing the latter into a first chamber and a second chamber, and a control valve located in a central hub part displaceable in unison with the movable wall structure, so as to establish, under the action of an input member, selective communication between said two chambers, characterized in that said chambers of said housing are sealingly delimited internally by a first flexible wall and a second flexible wall, respectively, which connect said central hub part to the corresponding said end wall of the housing, and in that said central hub part includes at least one transversing passage interconnecting permanently the central zones delimited externally by said first and second flexible walls.

4,499,813

PISTON-CYLINDER DEVICE

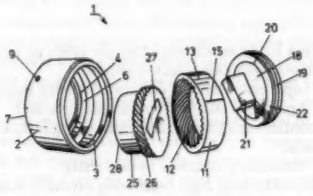
Heinz Lampert, Buchs, Switzerland, assignor to Werner Looser Maschinenbau + Hydraulik, Riedern, Switzerland

Filed Oct. 28, 1982, Ser. No. 437,448

Claims priority, application Switzerland, Nov. 10, 1981, 7228/81

Int. Cl.³ F01B *3/00*

U.S. Cl. 92—31 **7 Claims**



1. A device for exerting thrust forces, comprising a cylinder having a bore that is closed at an inner end of the cylinder and open at an outer end thereof, and a piston axially slidable in the cylinder and having an inner end cooperable with the inner end portion of the cylinder to define an expansible and contractable fluid chamber into which fluid can be delivered under pressure to force the piston through an extension stroke which is limited to a predetermined length that is small in relation to the diameter of the piston, said piston having a coaxial load supporting element fixed thereto which projects outward therefrom through the outer end of the cylinder and which moves outward relative to the cylinder in said stroke, said device being characterized by:

A. a guide ring inside the cylinder, surrounding the piston adjacent to its inner end, said guide ring having a concentric substantially cylindrical radially outer surface that is closely received within the cylinder and is substantially smooth to be rotatable in the cylinder;

B. axially oppositely facing circumferential abutment means on the guide ring and on the cylinder, confining the guide ring against axial motion relative to the cylinder and thereby confining the guide ring to rotation relative to the cylinder; and

C. said guide ring and the piston having interengaged helical flutings on their radially opposed surfaces, there being on each of those surfaces a plurality of said flutings at circumferentially spaced intervals therearound, said flutings being oriented to translate axial movement of the piston in its said extension stroke and in an opposite retraction stroke relative to the cylinder into relative rotation between the guide ring and the piston and serving to distribute non-coaxial load forces on the piston circumferentially around said radially opposed surfaces to prevent tilting of the piston relative to the cylinder.

4,499,814

GAS COMPRESSOR OR BLOWER

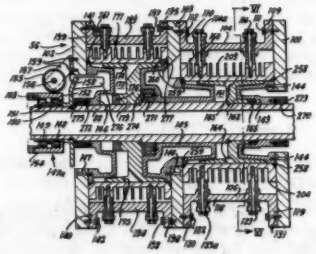
John M. J. Varga, 2 Lawrence Rd., Skircoat Green, Halifax, West Yorkshire, England

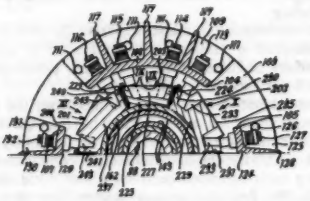
Continuation of Ser. No. 112,116, Jan. 14, 1980, abandoned. This application Dec. 9, 1982, Ser. No. 448,414

Claims priority, application United Kingdom, Jan. 15, 1979, 7901415

Int. Cl.³ F04B *7/06, 34/10*

U.S. Cl. 92—169 **7 Claims**





1. A gas compressor or blower comprising a cylinder defining at least one compression chamber, a piston reciprocable in

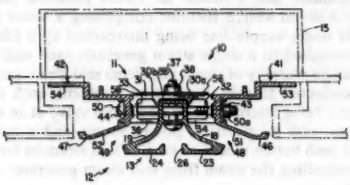
the cylinder to compress gas in said chamber, and ports allowing alternate induction of gas into said chamber and after compression, exhaust of gas from said chamber as said piston reciprocates characterized in that said cylinder comprises a plurality of circumferentially adjoining sealing segments, each segment having an inner surface region of arcuate cross-section, the inner surface regions of all the segments combining to form a substantially cylindrical surface of given axial length which the outer surface of the piston confronts during reciprocation, segments having been adjusted relative to support means and secured on said support means so that the clearance between the inner surface region of each segment and the confronting surface of the piston is sufficiently low to limit axial leakage between the piston surface and that surface region without the need for any piston ring; said piston being also rotatable in the cylinder and the ports comprise intake and exhaust ports spaced around the circumference of the cylinder and valving ports spaced around the circumference of the piston for cooperating with the cylinder ports, characterized in that two of the segments each have a respective one of the inlet ports formed through its radial thickness and opening into its inner surface region and a different two of the segments each have a respective one of the outlet ports formed through its radial thickness and opening into its inner surface region, the clearance between the inner surface region of each such segment and the confronting surface of the piston being sufficiently low to limit leakage to or from the respective port both axially and circumferentially of the piston when that port is fully confronted by the piston.

4,499,815

AIR DIFFUSER

Jack L. Burkarth, Dallas, Tex., assignor to Gulton Industries, Inc., Plano, Tex.

Continuation of Ser. No. 175,639, Aug. 6, 1980, Pat. No. 4,352,323, which is a continuation of Ser. No. 934,907, Aug. 18, 1978, abandoned. This application Jul. 1, 1982, Ser. No. 394,259
The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.
Int. Cl.³ F24F *13/06*
U.S. Cl. 98—40.14 **5 Claims**



1. A linear air diffuser for distributing a volume of air under pressure in a uniform output flow of controlled velocity and direction comprising:

a frame structure having a longitudinal air carrying channel with an upper air inlet having at least one longitudinally directed orifice and a lower air outlet;

means for controlling the flow of air into said channel through said upper inlet to be substantially constant along the length of said channel;

said frame structure comprising:

a side rail, extending longitudinally parallel to and defining one side of said channel, said rail having a side wall directed downwardly from said upper inlet and a lower flange beginning at the lower end of the side wall and extending laterally outwardly from said upper inlet to define the upper side of said outlet, and

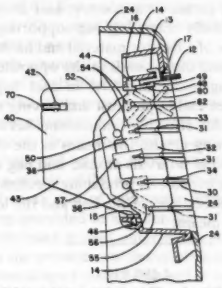
a deflector vane, extending longitudinally parallel to and defining another side of said channel, said vane having a curved air turning surface which includes a downwardly directed portion merging into a lower section defining the lower side of said outlet, said section extending laterally outwardly beyond and below the beginning of the flange of the side rail to overlap at least a portion of the flange so as to define with the flange said lower outlet, said curved air turning surface situated to intercept air entering said channel from said upper inlet such that the velocity of air flow adjacent to said curved surface is greater than the velocity of the air flowing adjacent to at least a porton of said side rail, thereby inducing upwardly directed eddy current in the output flow pattern generated by said channel, for delivery from the diffuser in a substantially lateral direction.

4,499,816

DISCHARGE AIR ASSEMBLY FOR A ROOM AIR CONDITIONER

Theodore S. Bolton, Liverpool; Brad G. Leech, Fayetteville, and Richard D. Lang, Chittenango, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,547
Int. Cl.³ F24F *13/15*
U.S. Cl. 98—40.26 **8 Claims**



6. An air directing assembly for covering an opening which comprises:

a circumferentially extending frame, defining a discharge area;

at least one vertical support member extending vertically across the discharge area from the frame at the bottom to the frame at the top, said support member defining spaced V-shaped slots on one edge and arcuate guide surfaces on the opposite edge;

horizontally extending rotatable louvers located to extend across at least a portion of the discharge opening, said louvers defining a louver slot extending from an edge of the louver inwardly to a slot base, the slot base of each louver mating with the narrow end of the V-shaped slot in the vertical support to serve as a pivot point; and

a louver retainer including means connecting the louver retainer to each louver, said means having a series of fingers engaged one to each of the louvers, said fingers extending on opposing sides of the vertical support in frictional engagement therewith, and a guide boss for engaging the arcuate guide surface of the vertical support, said louver retainer securing the louvers to the vertical support and translating rotational movement of one louver to the other louvers.

4,499,817
DISPOSABLE COOKING BAGS

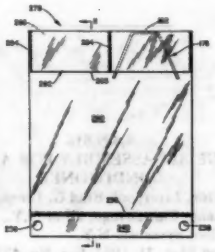
Alexander P. Janssen, 28 Old Farm Rd., Bellair, Charlottesville, Va. 22903

Division of Ser. No. 139,742, Apr. 14, 1980, Pat. No. 4,412,482, which is a continuation of Ser. No. 702,090, Jul. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 637,966, Dec. 5, 1975, Pat. No. 4,005,645, which is a continuation-in-part of Ser. No. 327,658, Jan. 29, 1973, Pat. No. 3,946,654. This application Mar. 8, 1983, Ser. No. 473,347

The portion of the term of this patent subsequent to Nov. 1, 2000, has been disclaimed.

Int. Cl.³ A47G *27/10*

U.S. Cl. 99—403 14 Claims



1. The combination of a disposable bag for cooking comestibles and a cooking utensil or accessory, said utensil or accessory having a vertically extending bag-supporting means and said bag being made of a flexible material and having side walls and closable open and closed ends at the opposite ends of the side walls; said bag being disposed in said bag-supporting means with the open end uppermost and having means at the closed end thereof for effecting connections between the bag and the bag-supporting means, the means at the closed end of the bag being spaced at intervals around said bag and being so constructed as to be capable of producing mechanical connections between the closed end of the bag and the lower part of the bag-supporting means.

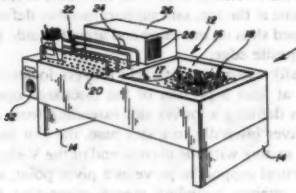
4,499,818
METHOD AND APPARATUS FOR HOLDING FRESHLY PREPARED FRIED FOOD PRODUCTS

William K. Strong, Solvang, Calif., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Sep. 30, 1982, Ser. No. 431,812

Int. Cl.³ A47J *36/24*

U.S. Cl. 99—483 15 Claims



1. An apparatus for holding and maintaining the crispness of freshly fried food products, comprising;

an upright, closed housing having an upwardly facing foraminous serving surface exposed to the surrounding atmosphere which provides an open product holding means adjacent the upper portion of the housing and adapted to receive food products such that said food products are exposed to the atmosphere, and from which the food products are to be served to customers;

air circulation means associated with said housing for forcibly circulating air through said housing and outwardly of the housing through said foraminous surface and about and through the food products which are exposed to the atmosphere in said product holding means; and

heater means associated with said air circulation means for selectively heating the circulating air so that said heated air is forcibly circulated about and through the food products in said product holding means, said air circulation means being disposed in said housing and with said heater means being disposed within said housing in full communication with said air circulation means.

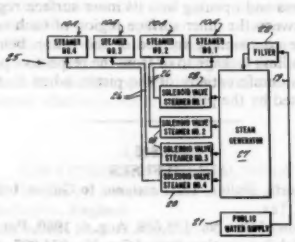
4,499,819
STEAMER

Julian C. Bailey, 107 S. Cecil St., Lexington, N.C. 27292

Filed Jun. 9, 1983, Ser. No. 502,738

Int. Cl.³ A47J *36/24*

U.S. Cl. 99—483 1 Claim



1. An improved steamer assembly, comprising, in combination, a plurality of individual steamers, each one of which comprises a case and a cover mounted upon the top of said case by means of a hinge, so as to receive food or other articles for being steamed, and a means for steam admitted into said steamer; a steam source therefor comprising a water supply line, said water supply line being intercepted by a filter and being connected to a single steam generator; and said means comprising a plurality of steam lines from said steam generator being connected to said plurality of steamers, each of said steam lines being intercepted by a solenoid valve in an electrical circuit with an electrical power source and a manually operated push button means on each of said steamers for selectively controlling the steam from said steam generator to said steamers.

4,499,820
BREATHER BAG CONSTRUCTION FOR A SEALED STORAGE STRUCTURE

Delmer R. Nelson, Cordova, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

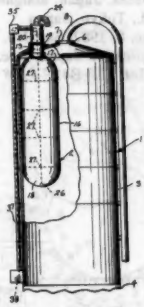
Filed Apr. 27, 1983, Ser. No. 489,035

Int. Cl.³ A01F *25/00*

U.S. Cl. 99—646 S 12 Claims

1. A breathing system for a sealed storage structure, comprising a sealed storage structure having an opening in the upper end, a flexible breather bag disposed within said structure and having a main body portion and a neck of reduced cross section, means for sealing said neck within said opening, a cable connected to the inside surface of said bag at the lower end of said bag and extending upwardly through said neck to the exterior of said storage structure, and means connected to said cable and located on the exterior of the structure for pulling the cable upwardly to draw the bag upwardly toward the upper end of said structure to a location where it will not interfere with the loading of a stored material into said struc-

ture, the interior of said bag being exposed to the atmosphere and the exterior of the bag being exposed to the pressure of said



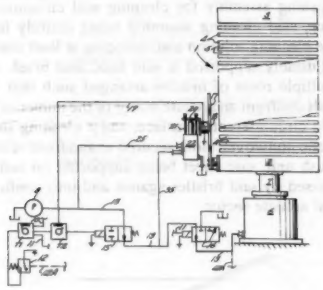
storage structure and said bag expanding and contracting to thereby compensate for pressure differentials between the atmosphere and the interior of the structure.

4,499,821

SYSTEM FOR IMMOBILIZING A PLYWOOD PRESS PLATEN DURING A PRESS CYCLE

John L. Clouston, 92966 Highway 99 South, Junction City, Oreg. 97448

Filed Feb. 23, 1984, Ser. No. 582,942
Int. Cl.³ B30B *15/16*
U.S. Cl. 100—51 **7 Claims**



1. A system for immobilizing the hydraulic cylinder and thrust platen of a plywood press powered thereby during a panel pressing cycle to avoid excessive panel compression, said system comprising,

a fluid pressure source,

valve means in communication with said pressure source and the platen powering cylinder to control fluid pressure to the platen powering cylinder during a first stage of press operation,

a valve assembly also in communication with said pressure source and the platen powering cylinder to control fluid pressure to said cylinder during a second stage of press operation,

timing means controlling said valve means to close same upon timing out to simultaneously terminate the first stage of press operation and initiate the second stage of press operation, and

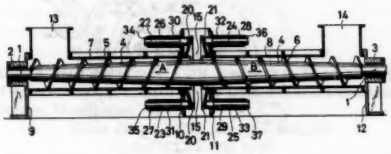
feedback means for sensing thrust platen movement during said second stage from a preselected platen position and mechanically actuating said valve assembly upon sensing platen movement whereby the valve assembly will control fluid flow to said cylinder to return the platen to said preselected position.

4,499,822

CONTINUOUS PRESS

Hachiro Sato, Tokyo, Japan, assignor to Fukoku Kogyo Company Limited, Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 526,150
Claims priority, application Japan, Sep. 10, 1982, 57-157744
Int. Cl.³ B30B *9/16*
U.S. Cl. 100—117 **2 Claims**



1. A continuous press comprising:

a frame;

a driving shaft journaled to the frame at its both ends by means of thrust bearings;

a screw drum disposed around the driving shaft to rotate therewith, said screw having a varying diameter which is gradually larger towards the center;

first and second screw blades symmetrically disposed around the outer surface of said screw drum, turning directions of the first and second screw blades being opposite to each other, said first and second screw blades having a constant pitch;

an outer drum arranged around the screw blades and having a number of small filtering holes;

first and second inlets provided in said outer drum for introducing raw materials into first and second spaces formed by the screw drum, first and second screw blades and outer drum, said spaces being gradually made smaller towards a center of the screw drum, said first inlet being provided in an end of said outer drum and said second inlet being provided in another end of said outer drum;

an outlet provided in said outer drum at its center for discharging the pressed raw material as cakes;

a pair of cone-shaped plates arranged in said outlet movably in a direction of the driving shaft; and

a means for resiliently pressing the cone-shaped plates towards each other.

4,499,823

CONTINUOUS PRESS, IN PARTICULAR FOR PRESSING BEET PULP AND OTHER JUICE-CONTAINING MATERIALS

Jean-Luc Berry, Compiegne, France, assignor to S.I.C.A. Pulposec de Chevrieres, Compiegne, France

Filed May 18, 1983, Ser. No. 495,778
Claims priority, application France, May 24, 1982, 82 08962
Int. Cl.³ B30B *9/20*
U.S. Cl. 100—121 **13 Claims**

1. A continuous press, in particular for pressing beet pulp and other juice-containing materials, the press comprising:

a rotatable rimmed wheel;

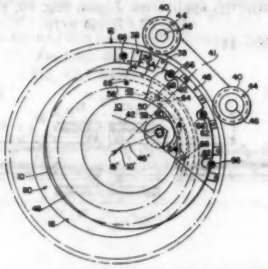
a rotatable ring having an inside diameter which is greater than the outside diameter of the rimmed wheel, the ring surrounding the wheel and being eccentrically mounted relative thereto, said ring having axial end faces;

thrust means for urging the wheel rim against the inside surface of the ring in a pressing region, said pressing region having axial ends;

means for inserting material to be pressed between the wheel rim and the surrounding ring upstream from the pressing

region, and means for removing pressed material downstream therefrom;

wherein the axial ends of the pressing region are closed by respective cheek plates, with each cheek plate being circular, and pressed in a substantially material-tight manner against a corresponding one of the axial end faces of the ring, said cheek plates being mounted in such a manner as



to leave axial access to the space between the wheel rim and the surrounding ring at points distant from the pressing region whereby material to be pressed may be inserted, and pressed material may be removed, said cheek plates being rotatably mounted separately from said wheel and said ring about an axis which is parallel to the wheel's axis of rotation and which is fixed relative thereto, such that said cheek plates may rotate with said wheel.

4,499,824

MACHINE FOR CRUSHING CYLINDRICAL ALUMINIUM CANS FOR BEER, SOFT DRINKS ETC.

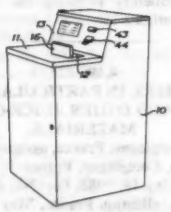
Ben Elwing, Gislaved; Peter Földi, Forsheda, and Göte Holmberg, Anderstorp, all of Sweden, assignors to Broderna Holmbergs Fabriks AB, Anderstorp, Sweden

Filed Sep. 9, 1983, Ser. No. 531,150

Claims priority, application Sweden, Sep. 9, 1982, 8205122

Int. Cl.³ B30B 9/32

U.S. Cl. 100—48 **8 Claims**



1. Machine for crushing cylindrical aluminium cans for beer, soft drinks, etc, comprising a can intake, a press device for squeezing the cans axially between the end walls thereof, a craddle for receiving the can in a substantially horizontal position, a closure member for the can intake, said craddle being placable between a receiving position in the can intake and a crushing position in the press device by displacement of the closure member between opened and closed positions, a collecting container, and a perforated sloping plane arranged below the press device for receiving the crushed can falling down from the press device at the return thereof after crushing and for diverting the crushed can to the collecting container.

4,499,825

INK WIPING DEVICE FOR INTAGLIO ROTARY PRINTING MACHINES

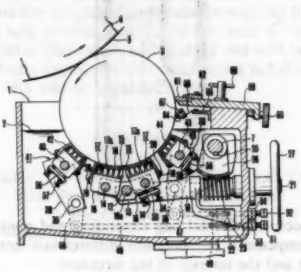
Chiyomatsu Uno, Saitama, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,880

Claims priority, application Japan, Dec. 12, 1981, 56-200564

Int. Cl.³ B41F 9/08

U.S. Cl. 101—167 **3 Claims**



1. An ink wiping device for an intaglio rotary printing machine having a plate cylinder supporting an intaglio printing plate wrapped therearound, comprising:

a tank for containing a cleaning solution therein;

an ink wiping roller rotatably supported in said tank and having a circumferential surface positioned for rolling contact with the printing plate, said ink wiping roller having a portion of said circumferential surface immersed in the cleaning solution; and

a cleaning assembly for cleaning said circumferential surface, said cleaning assembly being entirely immersed in the cleaning solution and including at least one brush unit adjustably supported in said tank, said brush unit having multiple rows of bristles arranged such that their distal ends confront an arcuate sector of the immersed portion of said circumferential surface, and a cleaning sheet of synthetic nonwoven cloth secured to and fixed relative to said brush unit, said sheet being supported on and resiliently pressed by said bristles against and into conformity with said arcuate sector.

4,499,826

CENTRAL GEAR DRIVEN FLEXOGRAPHIC PRINTING PRESS ACCOMMODATING DIFFERENT DIAMETER PLATE CYLINDERS

Dieter Regge, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Dec. 20, 1982, Ser. No. 451,346

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1981, 3150833

Int. Cl.³ B41F 5/16

U.S. Cl. 101—181 **7 Claims**

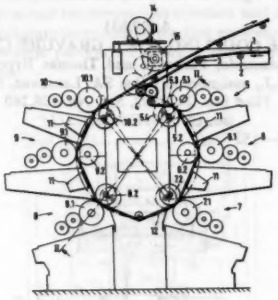
2. A flexographic printing press comprising:

a frame;

a plurality of plate cylinders each having a cooperating backing cylinder, each of the plate and backing cylinders mounted on rotatable shafts having gears and rotatably supported on said frame;

a central gear; the shafts of the backing cylinders are rotatably carried in annular segment supporting members, means mounting said supporting members for circumfer-

ential displacement along a circular path concentric with the central gear; and



clamping means to clamp said supporting members against said frame.

4,499,827

SYSTEM FOR AUTOMATICALLY REMOVING DUST FROM PLATE CYLINDERS OF PRINTING PRESS

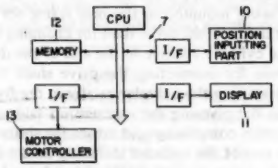
Hideo Takeuchi, Shiroi; Toshihisa Kaneko, and Satoshi Ikeda, both of Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

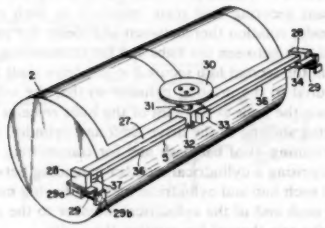
Filed Mar. 15, 1984, Ser. No. 590,205

Claims priority, application Japan, Mar. 22, 1983, 58-40884; Mar. 22, 1983, 58-47687

Int. Cl.[3] B41F *35/02;* B41L *41/02*

U.S. Cl. 101—425 8 Claims





1. A system for automatically removing dust from a plate cylinder of a printing press comprising:

a dust removing head mounted for displacement relative to and along the surface of a plate cylinder in the axial direction thereof of the printing press;

means for causing the dust removing head to advance toward and retract from the plate cylinder;

head moving means for causing the dust removing head to undergo said displacement to a position confronting any position on the plate cylinder surface;

dust removal position inputting means having a surface on which a printed matter is laid and having means which operates, when the position of a printing defect on the printed matter due to dust on the plate cylinder is pressed against said surface, to generate and transmit a position data signal corresponding to the position thus pressed with respect to the direction of the printed matter corresponding to the axial direction of the plate cylinder; and

operationally processing means for converting said position data signal from the dust removal position inputting means into data for so controlling the head moving means that it moves the dust removing head to the position along the plate cylinder corresponding to said portion of the printing defect pressed against said surface.

4,499,828

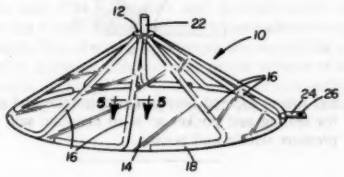
BARRIER BREACHING DEVICE

Charles A. Honodel, Tracy, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,112

Int. Cl.[3] F42B *3/00*

U.S. Cl. 102—301 14 Claims



1. A barrier breaching device comprising:

a hub;

a relatively flexible conical member affixed at its apex to said hub;

a plurality of relatively rigid spokes having explosive qualities, each spoke affixed at one end to said hub and extending therefrom to the base of said cone, said relatively flexible cone member affixed to said spokes in an umbrella-like fashion;

said explosive spokes having an explosive extension distal of said hub end, said extensions forming with said conical member a generally circular base;

said conical member and said spokes collapsible in a generally cylindrical manner for storage and transport; and

fuse means for detonating said explosive spokes and extensions.

4,499,829

EXPLOSIVELY SEPARABLE CASING

Albin K. Jacobson, Albuquerque, N. Mex.; Raymond E. Rychnovsky, and Cornelius N. Visbeck, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 8, 1983, Ser. No. 473,177

Int. Cl.[3] F42B *13/38, 4/12*

U.S. Cl. 102—378 11 Claims

1. An explosively separable casing comprising:

a cylindrical afterbody having a cylindrical tongue extending longitudinally from one end thereof;

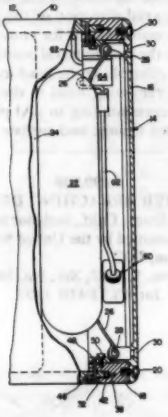
an end cover for said one end of said afterbody, said end cover having a cylindrical side wall in which a cylindrical shaped longitudinal groove is located, a portion of said groove being sized to receive said tongue of said afterbody while leaving a pocket between the end of said tongue and the remainder of said groove;

an explosive located in said pocket;

a frangible holding means which normally holds said cover

to said afterbody and which fails responsive to an increase in pressure in said pocket to release said cover;

means for igniting said explosive to cause said increase in pressure in said pocket to cause failure of said frangible holding means; and



a seal means located between said tongue and said groove for sealing said pocket so as to maintain said increase in pressure within said pocket.

4,499,830

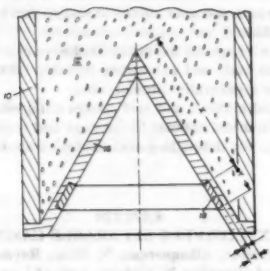
HIGH LETHALITY WARHEADS

John N. Majerus, Rising Sun, Md., and William P. Walters, Newark, Del., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 29, 1981, Ser. No. 280,585

Int. Cl.³ F42B *13/12*

U.S. Cl. 102—476 **9 Claims**



1. A lethal warhead for use against a target protected by vehicle outer armor which comprises:

a cylindrical body member having an explosive holding cavity therein and a forward end;

explosive means disposed in the holding cavity of said body member;

liner means fixedly disposed in said forward end of said body member for generating jet means and slug means for penetrating said armor which includes;

a conically-shaped metal liner having an annular groove disposed in an exterior wall of said liner means further including:

an arcuate-shaped metal liner; and

lethal means which includes an annular strip of lethal material fixedly disposed in said annular groove of said liner means, for providing a plurality of "follow-through" particles to violently interact with said target.

4,499,831

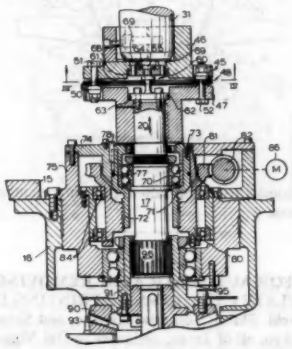
FLEXIBLE COUPLING FOR A GRAVURE CYLINDER

Frank J. Anastasio, Paramus, and Thomas Byro, Ringwood, both of N.J., assignors to Bobst SA, Lausanne, Switzerland

Filed Sep. 29, 1982, Ser. No. 428,240

Int. Cl.³ B41F *9/02, 13/14*

U.S. Cl. 101—152 **6 Claims**



1. In a printing press having a plurality of printing units, each printing unit including a unit frame having a housing supporting a drive shaft connected to a source of rotational motion, a printing cylinder mounted for rotation in a printing carriage having means for applying ink to the cylinder, said printing carriage being mounted in the unit frame for pivoting on a point on the axis of the drive shaft for changing the angle of the axis of the cylinder relative to the axis of the drive shaft, coupling means for connecting the drive shaft to the cylinder, means for shifting the cylinder axially in the frame of the unit and means for pivoting the carriage on said pivot point, the improvements comprising said means for shifting the cylinder along the axis of the cylinder including means for shifting the drive shaft along its axis in the housing and said coupling means including a pair of hubs with one hub secured to a shaft of the cylinder and the second hub secured to the drive shaft, at least one flexible plate member disposed between said hubs, means securing said plate members to each of the hubs to transfer rotation therebetween and means for preventing axial backlash between the hubs and for transmitting an axial force from the second hub secured to the drive shaft to the one hub secured to the printing cylinder so that the axial interval between the hubs at the axes of the hubs remains constant even during shifting of the drive shaft and cylinder, said means for preventing axial backlash and for transmitting an axial force comprising a cylindrical member extending between the hubs, and each hub and cylindrical member having means for securing each end of the cylindrical member to the respective hub on the axis thereof for rotation therewith.

4,499,832

APPARATUS AND METHOD FOR MATERIAL DISPOSAL

Roderick J. McNeil, 395 N. Candlewood Lake Rd., New Milford, Conn. 06776

Filed Dec. 23, 1983, Ser. No. 565,222

Int. Cl.³ F23G *7/04*

U.S. Cl. 110—238 **15 Claims**

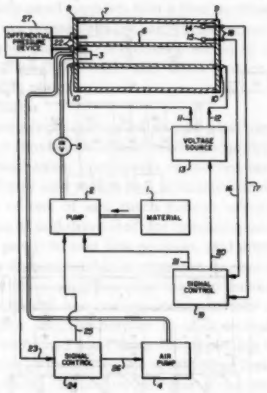
1. An apparatus for the environmentally safe disposal of material, comprising:

means for producing an aerosol of the material;

a first enclosure surrounding the aerosol and having a first porous portion including a first plurality of open pores;

the first porous portion being capable of being maintained at a predetermined temperature to combust said aerosol;

a second enclosure surrounding the first enclosure having a second porous portion including a second plurality of open pores;



means for supplying an oxidizing atmosphere to said first enclosure for the combustion of said aerosol; and

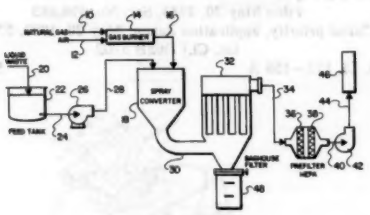
means to raise the temperature of the first porous portion to said predetermined temperature; whereby said aerosol is combusted near and within said first porous portion, and a flow of gases occurs from the interior of said first enclosure out through said first and second porous portions.

4,499,833

THERMAL CONVERSION OF WASTES

LeRoy F. Grantham, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 20, 1982, Ser. No. 451,516
Int. Cl.³ F23G 5/12
U.S. Cl. 110—342 **4 Claims**



1. A process for converting a strong cation exchange resin contaminated with a radioactive substance into a non-radioactive gas substantially free of oxides of sulfur and a radioactive inorganic ash which comprises:

introducing an aqueous slurry comprising said strong cation exchange resin and an alkaline material selected from the group consisting of alkali and alkaline earth metal hydroxides and carbonates, in the form of a finely atomized spray, into the top of a zone heated, by means of a hot gas produced externally of said zone and introduced into the top of said zone, to a temperature sufficient to convert said strong cation exchange resin, by contact with said hot gas, into a mixture of products comprising a non-radioactive gas substantially free of oxides of sulfur and a radioactive inorganic ash;

removing said mixture of products from the bottom of said zone; and

separating said radioactive inorganic ash from said mixture of products, the ratio of the volume of said strong cation exchange resin to the volume of said radioactive inorganic ash being in the range of about 20:1 to 70:1.

3. A process for converting a strong anion exchange resin contaminated with a radioactive substance into a non-radioactive gas substantially free of oxides of nitrogen and a radioactive inorganic ash which comprises:

introducing an aqueous slurry of said strong anion exchange resin in the form of a finely atomized spray into the top of a zone heated, by means of a hot gas produced externally of said zone and introduced into the top of said zone, to a temperature sufficient to convert said strong anion exchange resin, by contact with said hot gas, into a mixture of products comprising a non-radioactive gas containing oxides of nitrogen and a radioactive inorganic ash;

removing said mixture of products from the bottom of said zone;

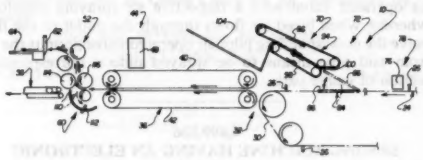
injecting a base selected from the group consisting of NH_3, CH_3NH_2 and $(CH_3)_2NH$ into said non-radioactive gas downstream of said zone to produce a non-radioactive gas substantially free of oxides of nitrogen and separating said radioactive inorganic ash, the ratio of the volume of said strong anion exchange resin to the volume of said radioactive inorganic ash being in the range of about 20:1 to 70:1.

4,499,834

REJECT ASSEMBLY FOR SHEET MATERIAL HANDLING APPARATUS

Rudolph H. Ruetschle, and John W. Raker, both of Elyria, Ohio, assignors to Harris Graphics Corporation, Melbourne, Fla.

Filed Dec. 10, 1982, Ser. No. 448,432
Int. Cl.³ D05B 23/00
U.S. Cl. 112—2 **17 Claims**



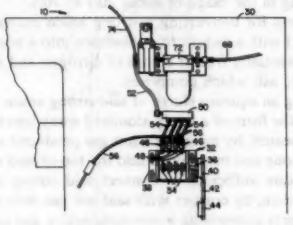
1. An apparatus comprising supply means for supplying sheets of material, support means extending along a path past said supply means to a stitching location, stitching means at said stitching location, means for feeding sheets from said supply means to form groups of sheets on said support means, reject means disposed along said path at a location between said supply means and said stitching location and operative to reject groups of sheets, said reject means including a reject ramp movable between a retracted position and an extended position wherein said reject ramp projects upwardly from said support means, and pusher means for normally sequentially pushing groups of sheets toward said stitching location when said reject ramp is in the retracted position and alternatively pushing groups of sheets onto said reject ramp when said reject ramp is in the extended position.

4,499,835

TUFTING MACHINES

Gary L. Ingram, Ooltewah, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed May 12, 1983, Ser. No. 493,989
Int. Cl.³ D05C *15/00*
U.S. Cl. 112—79 R **4 Claims**



1. In a tufting machine having a plurality of oscillating gauge parts divided into a number of sections extending transversely across the machine, a lint removal apparatus for blowing air from a high pressure supply onto said gauge parts to remove the lint from the gauge parts in each section, said apparatus comprising pipe means communicating with said supply for receiving air therefrom and having a portion extending transversely across said machine, a bleed air manifold, means for bleeding a small amount of the supply air from said pipe means to said manifold, a plurality of first valves corresponding in number to said number of sections, each of said valves having an inlet, an outlet and control means for communicating said inlet with said outlet, conduit means communicating said manifold with the inlet of each first valve, programmer means for driving the control means of the first valves in seriatim such that air from the manifold flows through the outlets of all the first valves in seriatim, a plurality of pilot air operated valves corresponding in number to said number of sections, each valve having an inlet communicating with said pipe means, an outlet and a control air port, means communicating the outlet of each first valve with the control air port of a corresponding pilot air operated valve, a plurality of air spraying manifolds corresponding in number to said number of sections, each spraying manifold being disposed adjacent to a corresponding section of gauge parts and having a plurality of spraying openings for directing air therein onto the gauge parts in that section, and conduit means communicating the outlet of each pilot air operated valve with a respective air spraying manifold, whereby when bleed air flows through the outlet of the first valve the corresponding pilot air operated valve permits the air from said pipe means to be sprayed onto a corresponding section of gauge parts.

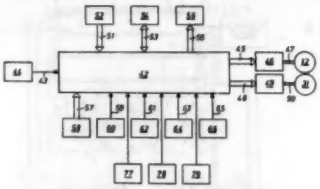
4,499,836

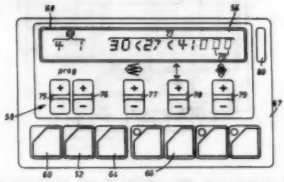
SEWING MACHINE HAVING AN ELECTRONIC CONTROL

Günter Meier; Willi Meier, and Jürgen Hartwig, all of Karlsruhe-Durlach, Fed. Rep. of Germany, assignors to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 533,007
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3235121
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **9 Claims**

1. A sewing machine comprising: an electronic fixed storage containing a plurality of data of sewing patterns, each pattern including stitch position and feed reference data and at least a single individual stitch; means for selecting one at a time of the sewing patterns contained in the fixed storage; manual setting means for varying the stitch position and feed reference data for selected sewing patterns; a microcomputer having a display unit which can be actuated by control means; a program storage; a program entering key for consecutively storing in the program storage the specific reference data of a respective selected single sewing pattern; a device for controlling the sewing machine parts responsible for the stitch formation in accordance with the data stored in the fixed storage and associated with the reference data; said display unit comprising a plurality of alphanumeric display elements arranged in a row, side by side; and means for switching the display unit into a





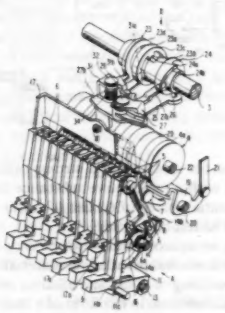
first operating state in which one selected sewing pattern and its associated reference data is indicated by a plurality of predetermined groups of said display elements, and into a second operating state in which a plurality of the selected sewing patterns stored in said program storage are indicated by a plurality of predetermined groups of display elements, in the sequence in which the selected sewing patterns are stored in said program storage.

4,499,837

STITCH PATTERN SELECTOR IN SEWING MACHINES

Kimihiko Yamamoto, Nagoya, and Hitoshi Ishikawa, Nishio, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 20, 1983, Ser. No. 496,683
Claims priority, application Japan, May 20, 1982, 57-085223
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 A **5 Claims**



1. A stitch pattern selector in a sewing machine, comprising:
(a) a plurality of depressable stitch pattern selector buttons;
(b) a plurality of pawl locks actuatable respectively by said

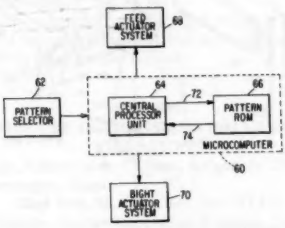
stitch pattern selector buttons to move to a locking position in response to the latter's being depressed;
(c) a plurality of drivable stitch pattern cams;
(d) a pivotable plate operatively connected to a needle-bar assembly of the sewing machine;
(e) a plurality of pivotably movable pawl supports;
(f) a plurality of pawls swingably mounted respectively on said pivotable pawl supports and movable with said pivotably movable pawl supports into a first position in which said pawls are pressed against said stitch pattern cams and said pivotable plate and a second position in which said pawls are disengaged from said stitch pattern cams and said pivotable plate;
(g) a drive shaft;
(h) means operatively connected to said pawl supports and operable for moving all of said pawls to said first position;
(i) a clutch mechanism operatively connected between said drive shaft and said means and actuatable in response to depression of one of said stitch pattern selector buttons and rotation of said drive shaft for operating said means to move said pawls to said first position, said clutch mechanism being disconnectable in response to continued rotation of said drive shaft for allowing said means to return said pawls except one corresponding to said one of the stitch pattern selector buttons to said second position, whereby one of said pawl supports supporting said one of the pawls can be locked by one of said pawl locks actuated into said locking position by said one of the stitch pattern selector buttons.

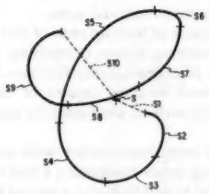
4,499,838

PATTERN DATA STORAGE BY EQUATIONS IN AN ELECTRONICALLY CONTROLLED SEWING MACHINE

Alfonse N. Voza, Jersey City, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 4, 1984, Ser. No. 646,889
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—266.1 **2 Claims**





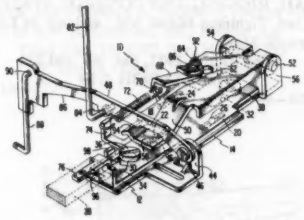
1. In an electronically controlled sewing machine capable of stitching along a continuous path to form a sewn pattern, said sewing machine including a memory and means for selectively retrieving information from said memory for controlling the stitch forming instrumentalities of the sewing machine, a method for storing in said memory information sufficient to cause said sewing machine to stitch along said continuous path comprising the steps of:
(a) dividing said continuous path into a plurality of contiguous segments;
(b) providing for each of said segments in terms of two angularly related axes a second order equation defining said each segment; and
(c) storing for each of said segments representations of the length of said each segment and its slope and rate of change of slope at the start of said each segment.

4,499,839

REVERSE FEED CONTROLLING MECHANISM FOR A SEWING MACHINE

John Blackwood, Union; Thomas G. Graham, Ocean, and Robert B. Brauch, Wayne, all of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 3, 1983, Ser. No. 558,082
Int. Cl.³ D05B *27/00, 3/04*
U.S. Cl. 112—317 **11 Claims**



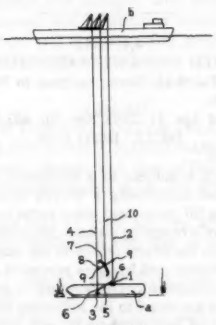
1. In a sewing machine, an input control member mounted for a linear and pivotal movement by a machine operator, a pivoted feed regulating lever, a pivoted member extending under a portion of the feed regulating lever, a ramp on one of the said members, and a foot on the other member positionable along the ramp during linear movement of the control member for causing the member extending under the pivoted lever to tilt upwardly and by engagement with said lever pivotally move the lever into a reverse feed controlling position.

4,499,840

METHOD FOR THE SALVAGE OF A SUNKEN VESSEL

Chao Lung-Tung, No. 32, Chung Cheng 4th Rd., Kaohsing City, Taiwan

Filed Nov. 18, 1982, Ser. No. 442,744
Int. Cl.³ B63C *7/08*
U.S. Cl. 114—51 **1 Claim**



1. A method for the salvage of a sunken vessel comprising the steps of detecting the location and depth of said sunken

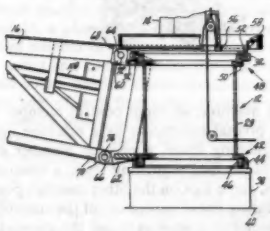
vessel, lowering successively two electromagnets with respective guide ropes from a salvage station together with a first retaining rod interconnected between said ropes, said first retaining rod having a length greater than the width of said vessel, thereby to attach said electromagnets on said vessel along opposite sides thereof at an angle other than 90° with respect to a longitudinal axis of said vessel, lowering a clamping apparatus together with a second retaining rod with a tailing rope utilizing said respective guide ropes, said clamping apparatus and said second retaining rod being substantially connected perpendicular to each other and said second retaining rod having a length substantially equal to that of said first retaining rod and parallel thereto, whereby said clamping apparatus reaches and clamps said vessel at an angle complementary to said first mentioned angle, and lifting said vessel by means of said electromagnets and said clamping apparatus with a conventional winding machine for lifting up said tailing rope and said respective guide ropes so that said vessel is supported at four points.

4,499,841

SAIL RIGGING AND CONTROL SYSTEM

John G. Lord, Tighlman Island, Md., assignor to Lloyd Bergeson, Norwell, Mass.

Filed Aug. 5, 1981, Ser. No. 290,234
Int. Cl.³ B63H *9/04*
U.S. Cl. 114—98 **8 Claims**



7. A sail support system for a ship, comprising a support fixed to the ship so as to be non-rotatable in relation thereto, a boom support rotatably mounted on the fixed support, a mast rotatably mounted on the boom support, mast rotating means acting between the boom support and the mast to cause rotation of the mast in relation to the boom support, and boom rotating means acting between the ship and the boom support to cause rotation of the boom support in relation to the ship, whereby said mast rotating means also causes rotation of the mast with the boom when the boom is rotated.

4,499,842

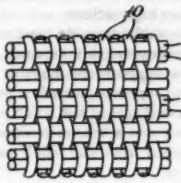
SAIL CLOTH AND SAIL MADE THEREFROM

Peter F. Mahr, Fairfield, Conn., assignor to North Sails, Inc., Pewaukee, Wis.

Filed Apr. 11, 1983, Ser. No. 483,913
Int. Cl.³ B63H *9/06*
U.S. Cl. 114—103 **5 Claims**

1. A sail which is subject to a maximum load in a given direction, said sail comprising a woven cloth having warp yarns intersecting fill yarns, said warp yarns being arranged in adjacent sectors of a repeating pattern designated by the letters (r)-(t)-(v), wherein the letters represent the number of yarns in each respective sector, and hyphens represent a number of fill yarns at each intersection corresponding to (n), and wherein (r), (t), (v) and (n) are equal to the following numbers of yarns and combinations of said numbers in each designation as follows:

(r) is one, two or three,
(t) is two, or three,
(v) is zero, one or two,
(n) is one or two,



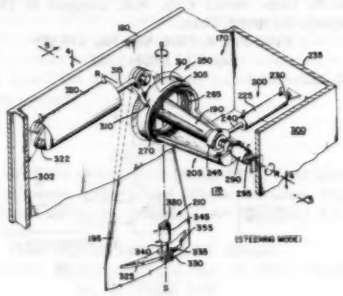
said cloth being oriented in said sail such that said warp yarns are substantially aligned in said direction of maximum load whereby to improve stretch resistance in said direction.

4,499,843

STRUT STEERING AND RETRACTING APPARATUS

John W. Williams, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 31, 1981, Ser. No. 298,133
Int. Cl.³ B63B *1/28*
U.S. Cl. 114—280 **23 Claims**



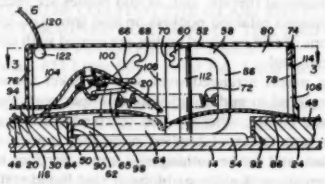
1. A lock assembly, comprising:
a first arm having a bearing surface,
a second arm having a bearing surface, said second arm being pivotably mounted to said first arm;
means for pivotably mounting said arms,
clamping means capable of holding each of said arm bearing surfaces, said clamping means comprising a first latch member capable of clamping said first arm bearing surface, a second latch member capable of clamping said second arm bearing surface, and means for supporting said latch members;
means forcing said arms into contact with said clamping means, said forcing means comprising a first lockable link pivotably mounted to said first arm, a second lockable link pivotably mounted at one of its ends to said first link and at its other end to said second arm, and means capable of applying a force along a single direction at the point where said second link is pivotably mounted to said first link, and
means releasing said arm bearing surfaces from the hold of said clamping means.

4,499,844

METHOD AND APPARATUS FOR RELEASING A SUBMERGED LIFE RAFT

James M. Parish, Wadsworth, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 24, 1983, Ser. No. 544,344
Int. Cl.[3] B63B 23/00
U.S. Cl. 114—367 15 Claims



13. A method for releasing a raft from a deck submerged beneath a water surface to a predetermined depth wherein a latch means holds the raft to the deck and wherein the raft is usually launched by a davit launch including a davit and fall connectable to said raft by a davit hook having a release lanyard comprising:

(a) releasably fastening a painter line connectable to the raft to a retaining member mounted on the deck at least prior to submersion,

(b) releasably fastening the release lanyard to the retaining member at least prior to submersion,

(c) actuating said latch means to release the raft from the deck in response to a submerging of the deck to the predetermined depth,

(d) actuating the retaining member to secure the painter line to the retaining member in response to a lifting movement of the raft off the deck to limit movement of the raft on the water surface to an area generally above the retaining member,

(e) securing the release lanyard to the retaining member upon actuation of the retaining member at the predetermined depth, and

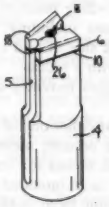
(f) releasing the raft from the davit hook in response to lifting of the raft off the deck and tensioning of the release lanyard to open the davit hook.

4,499,845

HORN FOR USE IN TRANSMITTING ULTRASONIC VIBRATIONS

John R. Pope, Lutterworth, England, assignor to USM Corporation, Farmington, Conn.

Filed Nov. 16, 1981, Ser. No. 321,532
Claims priority, application United Kingdom, Nov. 18, 1980, 8036963
Int. Cl.[3] B06B 3/00; B23K 1/06, 5/20
U.S. Cl. 116—137 A 11 Claims



1. A horn for use in transmitting ultrasonic vibrations to a workpiece comprising:

a body portion

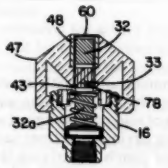
a detachable workpiece-engaging non-circular end portion; and a securing member arranged to detachably secure the non-circular end portion to the body portion, the securing member comprising a first threaded portion received in a tapped hole in the body portion and rotatable therein to alter the orientation of the securing member relative to the body portion, and a second threaded portion of different pitch and/or handedness to the first threaded portion on to which the non-circular end portion has been rotated while the securing member was held against rotation relative to the body portion to bring the non-circular end portion into tight contact with the body portion with the second threaded portion being received into a hole tapped completely through the non-circular end portion, the arrangement being such that the orientation reached by the non-circular end portion, relative to the body portion, when the non-circular end portion is in tight contact with the body portion, can be corrected by rotation of the securing member relative to the body portion.

4,499,846

PLUNGER AND TRANSPARENT INDICATOR

Ned Bergeron, and Theodore A. Stollberg, both of Houma, La., assignors to B.W.B. Controls, Inc., Houma, La.

Filed Dec. 15, 1982, Ser. No. 450,119
Int. Cl.[3] G01L 7/16, 19/08
U.S. Cl. 116—272 17 Claims



1. An indicating apparatus which comprises:

a. a unitary transparent lens housing having an axial bore therethrough and a counter bore in the uppermost portion of said bore, said counter bore having a sleeve member therein;

b. a single information-containing member at least partially positioned and linearly movable in response to fluid changing conditions in said apparatus within said bore in said housing, said member having at least two visually distinctive information portions viewable from a top view and side view through said housing; and

c. means for displaying and refracting ambient light reflected by said information portions, comprising a double truncated prismatic lens intregral with said housing which slidably receives said information containing member in said axial bore and is substantially perpendicular to said information containing member.

4,499,847

APPARATUS FOR COATING GRANULES SUCH AS DRAGéE PELLETS WITH A HARDENABLE SUBSTANCE

Rudolf Dunaitschik, Bodolz, Fed. Rep. of Germany, assignor to Driam Metallprodukt GmbH & Co. KG, Eriskirch, Fed. Rep. of Germany

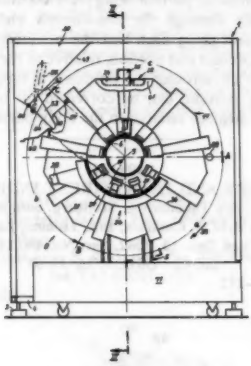
Filed May 11, 1982, Ser. No. 377,033
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 3131808
Int. Cl.[3] B05C 5/00, 3/08
U.S. Cl. 118—19 20 Claims

1. An apparatus for coating granules with layers of a hardenable substance and drying said layers, comprising:

a drum rotatable about a substantially horizontal axis and provided with a closable access aperture enabling its

loading and unloading, said drum having a peripheral wall in the shape of a hollow regular prism formed from a multiplicity of flat panels adjoining one another at obtuse angles along parting edges parallel to said axis and defining respective inner prism faces, each panel having an axially extending perforated midzone;

a set of hollow elongated baffles on each of said prism faces extending across the respective midzone and projecting in a lower region of the drum into an overlying granule bed for agitating the granules thereof, each baffle having perforated extremities laterally offset from the perforated midzone of the respective panel; and



conduit means communicating with an external source of pressurized drying fluid and forming supply channels on the outer surfaces of said panels aligned with the midzones thereof for feeding drying fluid from said source through the perforations of panels underlying the granule bed to the interior of the drum, part of the drying fluid passing from said supply channels directly into the granule bed via said midzones while another part enters the baffles on the underlying panels and reaches the granule bed through the perforated extremities thereof.

4,499,848

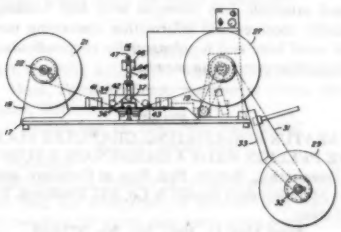
COATING APPARATUS FOR BODIES OF ELECTRICAL COMPONENTS HAVING AXIAL LEADS

John Malocchi, Pelham, N.H., assignor to GTE Communications Products Corporation, Stamford, Conn.

Filed Dec. 19, 1983, Ser. No. 562,935

Int. Cl.³ B05C *1/02, 3/09, 9/04*

U.S. Cl. 118—45 **11 Claims**



1. Apparatus for applying film coatings of material to bodies of electrical components having axial leads, the ends of the axial leads supported in spaced relationship by a parallelly arranged pair of tapes, comprising:

a reservoir for supporting said material in a liquid state;

means for transporting said components and tape;

a sprocket adapted to rotate about its principal axis between said parallelly arranged pair of tapes, having a circumferential row of transversely oriented pockets for receiving said bodies of electrical components whereby said axial leads of received components are oriented parallel to said principal axis, said sprocket being oriented with respect to said reservoir so that, as said sprocket rotates about said principal axis, sequential ones of said pockets pass through said liquid state material, retaining menisci of said liquid state material therein, and, as said bodies are received by said menisci retained pockets on said sprocket, underside portions of said received bodies are coated with said liquid material; and

brushing means arranged over said sprocket for applying said material in said liquid state to upper portions of said received bodies, whereby said received bodies have said liquid state material applied over their entire external portions, and for smoothing said upper portions to avoid the formation of globs or blobs of said liquid state material.

4,499,849

APPARATUS FOR CLEANING A RECORDING MEDIUM

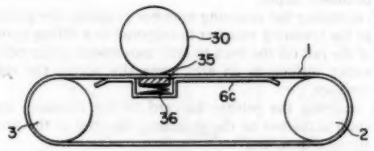
Satoru Tomita; Akira Shimura, both of Kawasaki, and Takashi Yokota, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Apr. 5, 1982, Ser. No. 365,469

Claims priority, application Japan, Apr. 6, 1981, 56-51578; Apr. 10, 1981, 56-53909

Int. Cl.³ G03G *21/00*

U.S. Cl. 118—652 **21 Claims**



1. An apparatus for cleaning a recording medium in the form of an endless belt extended between at least a pair of rollers, having a recording surface on which a developed image is formed and a back surface which is on the opposite side of said recording surface, after transferring a developed image comprised of color particles and formed on said recording surface to a transfer medium thereby preparing said recording medium for use in the next cycle of operation, comprising:

means for removing residual color particles remaining on the recording surface of said recording medium after image transfer, said means for removing being disposed on the recording surface side of said recording medium;

supporting means for rotatably supporting said pair of rollers such that one of said rollers is spring-biased against said endless belt-like recording medium to keep it in tension, said supporting means including a supporting surface which faces the back side of said recording medium and which is provided with a recess;

a bar-like counter member movably disposed inside of said recess;

means for urging at least either one of said means for removing and said bar-like counter member against the other thereby bringing said means for removing and said bar-like counter member in an intended pressure contact with said recording medium from both sides such that said intended pressure contact is maintained substantially constant during the entire cleaning operation; and

means for causing a relative motion between said means for removing and said recording medium thereby allowing said means for removing to remove the residual color

particles from the recording surface of said recording medium.

4,499,850

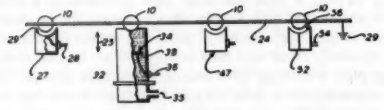
APPARATUS FOR COATING THE GLASS ENVELOPE AND PREDETERMINED PORTIONS OF THE END CAPS OF A FLUORESCENT LAMP

James D. Nolan, 623 Little Silver Point Rd., Little Silver, N.J. 07739

Division of Ser. No. 404,499, Aug. 2, 1982, which is a continuation-in-part of Ser. No. 196,077, Oct. 10, 1981, abandoned, which is a continuation of Ser. No. 44,473, Jun. 1, 1979, abandoned, which is a continuation of Ser. No. 940,292, Sep. 7, 1978, abandoned, which is a continuation of Ser. No. 759,823, Jan. 17, 1977, abandoned. This application Jul. 25, 1983, Ser. No. 516,654

Int. Cl.[3] H01J *61/35*

U.S. Cl. 118—406 4 Claims



1. Apparatus for coating the glass envelope of a fluorescent lamp and a predetermined portion of the end caps of said lamp with a coating of polymeric material and wherein said lamp is provided with at least one electrical connecting pin on each end cap and wherein said end caps are secured to said glass envelope at radial positions with respect thereto, comprising:

(a) means for engaging said end caps of said lamp to secure said end caps against radial displacement with respect to said glass envelope;

(b) means for preheating said glass envelope and at least said predetermined portion of said end caps to a first predetermined temperature above the melting point of said polymeric material for a first predetermined period of time;

(c) means for rotating said fluorescent lamp during said preheating to insure uniform preheating of said glass envelope and said at least predetermined portion of said end caps;

(d) means for masking said pins and all of said end caps except said predetermined portion thereof;

(e) means providing a fluidized bed of powder of said polymeric material;

(f) said means for rotating sad fluorescent lamp for rotating said fluorescent lamp over said fluidized bed for a second predetermined period of time to apply a coating of said powder to said glass envelope and to said predetermined portion of said end caps;

(g) means for reheating said glass envelope and said at least predetermined portion of said end caps to a second predetermined temperature above said melting point of said polymeric material for a third predetermined amount of time to melt and fuse said powder applied to said glass envelope and said predetermined portion of said end caps to form said applied powder into said coating of polymeric material;

(h) said means for rotating said fluorescent lamp for rotating said fluorescent lamp during said reheating to assure that said applied powder is melted and fused into a substantially uniformly thick coating of said polymeric material; and

(i) means for unmasking said end caps and said pins and for disengaging said end caps.

4,499,851

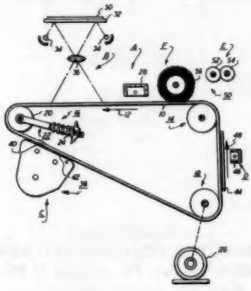
SELF-SPACED DEVELOPMENT SYSTEM

John J. Kopko, Macedon, and Dan A. Hays, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 111,450, Jan. 11, 1980, abandoned. This application Nov. 25, 1983, Ser. No. 555,258

Int. Cl.[3] G03G *15/09*

U.S. Cl. 118—658 16 Claims



1. An apparatus for developing a latent image recorded on a flexible member, including:

a tubular member journaled for rotary movement;

means for rotating said tubular member to transport developer material into contact with the latent image in a development zone;

a magnetic member disposed interiorly of and spaced from said tubular member for attracting the developer material to said tubular member, said magnetic member being oriented so that the magnetic poles thereon generate a strong magnetic field in the development zone entrance and a weak magnetic field in the development zone; and

means for maintaining the flexible member, in at least the region of the development zone, at a pre-selected tension of sufficient magnitude so that the developer material being transported into contact with the flexible member by said tubular member is compressed between said tubular member and the flexible member in the development zone with the flexible member wrapping about at least a portion of said tubular member forming an extended development zone.

4,499,852

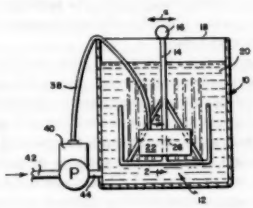
APPARATUS FOR REGULATING PLATING SOLUTION IN A PLATING BATH

B. Christian Castner, Westford, Mass., assignor to Shipley Company Inc., Newton, Mass.

Filed Jul. 15, 1980, Ser. No. 169,129

Int. Cl.[3] B05C *11/10*

U.S. Cl. 118—690 10 Claims



1. Apparatus for regulating the concentration of dissolved metal in an electroless plating bath comprising a sensor sus-

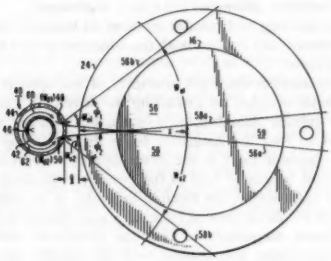
pended in the bath responsive to the concentration of said dissolved metal and capable of generating a signal, means for oscillating the sensor in the bath, a pump for supplying replenisher solution to the bath, said pump being connected a supply of replenisher solution for said dissolved metal and to the sensor operable in response to the signal from the sensor to supply replenisher solution from said source to the path in sufficient quantity to compensate for the depletion of the dissolved metal removed during the plating operation.

4,499,853

DISTRIBUTOR TUBE FOR CVD REACTOR

Edward A. Miller, Yardley, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 9, 1983, Ser. No. 559,720
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—725 **4 Claims**



1. An apparatus for chemically vapor-depositing a material onto surfaces of a plurality of substrates spaced apart in a stacked parallel array within a reaction chamber, wherein said substrates are heated while contacting said surfaces with a gaseous compound of said material to be deposited, said apparatus having means for rotating said substrates about an axis perpendicular to said substrates, and coaxial tubular means extending parallel to said substrate axis for providing a flow of gas carrying said material, the improvement wherein:

said coaxial tubular means comprises a first inner tube fixed coaxially within a second outer tube in fixed position within said chamber;

said first tube having a plurality of openings located along a path extending longitudinally along the surface of the first tube to direct gas in a plurality of gas streams to the inner wall of said second tube;

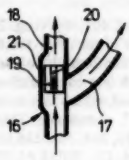
said second tube having at least two slots parallel to each other and extending longitudinally along the surface of the second tube facing said substrates to provide at least two overlapping gas streams directed towards said stack of substrates such as to pass through the spacing between the substrates and pass over the surfaces of said rotating substrates, the width of each slot being selected so that the velocity of the gas streams flowing through said slots onto said substrates is substantially free of turbulence, whereby the thickness of the deposited material on each substrate surface is substantially uniform and the deposition rate can be significantly high.

4,499,854

APPARATUS FOR CONVEYING MILK USING AN UNDERPRESSURE

Tilman Hoefelmayr, Niederteufen, Switzerland, and Jakob Maier, Tuerkheim, Fed. Rep. of Germany, assignors to Biomelktechnik Hoefelmayr & Co., Niederteufen, Switzerland

Filed Sep. 8, 1982, Ser. No. 415,869
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136841
Int. Cl.³ A01J *7/00*
U.S. Cl. 119—14.32 **17 Claims**



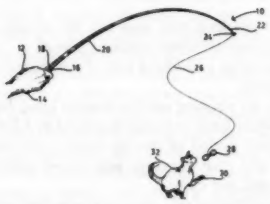
1. An apparatus for conveying milk, comprising: a milk supply device; a milk discharge pipe provided at a location spaced above said milk supply device; means for producing a vacuum in said milk discharge pipe; and means for conveying milk upwardly from said milk supply device to said milk discharge pipe, including valve means, a first milk pipe providing fluid communication between said valve means and one of said milk supply device and said milk discharge pipe, and second and third milk pipes which each provide fluid communication between said valve means and the other of said milk supply device and said milk discharge pipe; wherein said valve means is responsive to the rate of fluid flow through said conveying means for permitting and substantially obstructing fluid flow through said third milk pipe when the rate of fluid flow through said conveying means is respectively above and below a predetermined milk flow rate.

4,499,855

KITTY TEASE

John Galkiewicz, P.O. Box 120, Harrogate, Tenn. 37752

Filed Aug. 18, 1983, Ser. No. 524,420
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—29 **16 Claims**



1. An entertaining and exercising toy manipulated by a human operator for a small animal such as a kitten or cat comprising:

an elongated handle member having a first end and a further end, said handle member suitable for gripping and manipulation by such human operator;

a flexible rod member having a base end and an attaching end, said base end fixedly secured to said further end of said handle member, said rod member being substantially longer than said elongated handle and having a flexibility which varies in a selected manner between said base end and said attaching end;

an attaching means fixedly secured to said attaching end of said rod member;

a substantially non-stretchable length of cord having one end secured to said attaching means; and

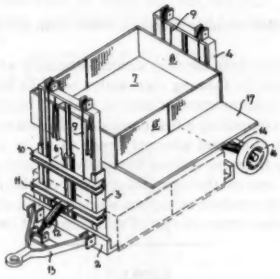
a target member attached to a further end of said length of cord, said target member being of a size and weight suitable for batting, said target member further having a cover material suitable for snagging or holding with the claws of such animal such that such animal can snag said target member and pull thereon causing said flexible rod to bend and thereby create resistance to movement of said target member by such animal for entertainment and exercise of such animal.

4,499,856

MEANS FOR LOADING FOWL ONTO A TRANSPORTING VEHICLE

Betsalel Hecht, and Silviu Hecht, both of P.O.B. 231, Ashqelon 78101, Israel

Filed Aug. 22, 1983, Ser. No. 525,546
Claims priority, application Israel, Aug. 23, 1982, 66627
Int. Cl.³ B60P *3/04;* A01K *29/00*
U.S. Cl. 119—82 **5 Claims**



1. A means for loading fowl into a transporting vehicle comprising a structure including a four-sided generally horizontally arranged chassis having a pair of opposite first sides and a pair of opposite second sides extending between said first sides with said second sides being elongated relative to said first sides, a pair of wheels located adjacent and outwardly from one of said first sides, a first hydraulic cylinder connected to said one of said first sides and to said pair of wheels for pivoting said pair of wheels in the vertical direction relative to said chassis between a first position spaced below said chassis and a second position spaced vertically upwardly from the first position relative to said chassis, coupling means located at and extending outwardly from the other said first side for attaching said structure to a prime mover, a second hydraulic cylinder connected to said coupling means and to said other first side for moving said coupling means vertically relative to said chassis between a lower position comparable to said first position of said pair of wheels and an upper position comparable to said second position to said pair of wheels, a collector cage mounted on on said chassis, said collector cage having a horizontally arranged floor, and means mounted on said chassis and connected to said collector cage for moving said collector cage upwardly and downwardly relative to said chassis so that said floor thereof is at a selected level.

4,499,857

FLUIDIZED BED FUEL BURNING

Alex F. Wormser, Marblehead, Mass., assignor to Wormser Engineering, Inc., Woburn, Mass.

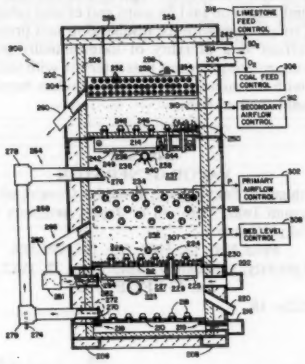
Filed Oct. 17, 1983, Ser. No. 542,646
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—4 D **4 Claims**

1. A method of burning coal comprising

burning coal in a first fluidized bed chamber having tubes carrying steam heated therein, said tubes not being covered when said bed is not fluidized and being covered when said bed is fully fluidized,

treating the gaseous products of combustion from said first fluidized bed in a second fluidized bed to provide a treated stack gas,

controlling the rate of airflow into said first fluidized bed based upon the pressure of steam in said tubes,



controlling the ratio of the rate of airflow to the rate of feeding coal based upon the concentration of oxygen in said stack gas, and

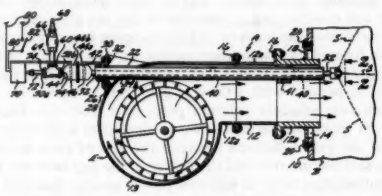
controlling the level of solids in said first fluidized bed based upon the combustion bed temperature in said first fluidized bed.

4,499,858

FUEL BURNING ASSEMBLY

Graham D. Councell, 8242 Brookgreen Rd., Downey, Calif. 90240

Filed Feb. 2, 1984, Ser. No. 576,522
Int. Cl.³ F22B *5/00*
U.S. Cl. 122—14 **4 Claims**



1. In a boiler that includes a fire box having a rearward wall that has an opening therein; a plurality of boiler tubes disposed above said fire box; a power driven blower that includes a housing that has a pressurized air discharge opening from which a tube extends to said opening in said rearward wall to discharge a current of air into said fire box; a source of pressurized flowable fuel, the combination with said boiler of a burner assembly that substantially blankets all of said boiler tubes with a sheet of flame when said fuel is burned, said burner assembly including:

a. a low speed rotational power source that includes a drive shaft, said rotational power source situated rearwardly of said housing;

b. a tubular tee that has first, second and third legs, said tee situated between said drive shaft and housing, said first and second legs axially aligned with said drive shaft;

c. an elongate tubular member that is sealingly connected to said drive shaft and rotated thereby, said tubular member

extending through said first and second legs, an opening in said housing, and longitudinally through said tube to terminate in a forward end in said fire box, with said tubular member having an apertured section within said tubular tee;

d. first means for conducting said pressurized flowable fuel from said source to said third leg, with said fuel entering said tubular member through said apertured section; and

e. second means on said forward end of said tubular member that rotate therewith for discharging said pressurized fuel therefrom as a plurality of longitudinally and laterally moving rotating streams that intermix with said current of air, with the mixture of fuel and air when burning providing said shaft of flame.

4,499,859

VAPOR GENERATOR

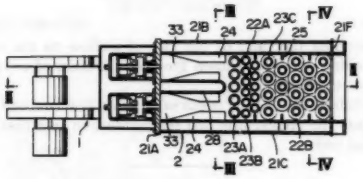
Akira Nishiguchi; Sanpei Usui; Tomihisa Oouchi, all of Ibaraki, and Kazumi Iwai, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 18, 1983, Ser. No. 495,584

Claims priority, application Japan, May 21, 1982, 57/84740

Int. Cl.³ F22B *5/02*

U.S. Cl. 122—18 **14 Claims**



1. A vapor generator having a burner section and a boiler section, said boiler section including an outer casing, an inner casing disposed in said outer casing, and a plurality of solution tubes attached in rows to inner surfaces of walls of said inner casing so as to extend substantially vertically, an interior of said tubes being in communication with a space accommodating a medium to be heated and defined between said inner casing and outer casing, a plurality of fins are attached to the inner surfaces of the walls of said inner casing in an area around a flame formed by said burner section, an axis of each of said solution tubes in a second row is offset from a line which extends in parallel with a flow of gas from a center of a gap between two adjacent solution pipes in a first row located upstream from said second row, as viewed in a direction of flow of the gas, a distance between the axis of each solution tube in said second row and the center of the gap between two adjacent solution tubes in said first row is greater than S/2 but not greater than (D−S)/2, where:

S represents the gap between two adjacent solution tubes in said first row, and

D represents an outside diameter of a solution tube in said second row.

4,499,860

FURNACE BUCKSTAY DESIGN

Robert W. Loomis, Tariffville, and Carl W. Lawton, West Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

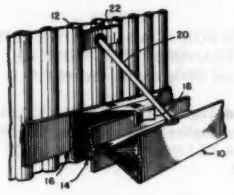
Filed Sep. 6, 1983, Ser. No. 529,308

Int. Cl.³ F22B *37/24*

U.S. Cl. 122—510 **2 Claims**

1. A rectangular furnace comprised of vertical walls formed by a series of laterally adjacent upright water-cooled tubes, and a furnace wall support system formed of a plurality of horizontally disposed buckstays extending transversely around the vertical walls of the furnace in vertically spaced arrangement from which the furnace walls are supported, characterized in that each of said plurality of buckstay beams comprises:

a. an elongated channel beam having a horizontally disposed central member and first and second vertically disposed end members extending along the lateral edges of the central member so as to form an I-beam cross-section having an upwardly facing channel and a downwardly facing channel on opposite sides of the central member, the second vertically disposed end member spaced further away from the furnace wall than the first vertically dis-



posed end member is spaced away from the furnace wall; and

b. an anti-bucking member means associated with said channel beam for forming therewith a box-like section having a high polar moment of intertia, said anti buckling member means comprising a first elongated plate member mounted to said elongated channel beam so as to extend transversely from the second vertically disposed end member across one of the upwardly facing or the downwardly facing channels so as to form a first box-like section within the I-beam cross-section of said elongated channel beam.

4,499,861

METHOD AND APPARATUS FOR THE INJECTION OF ALCOHOL FUELS, MORE PARTICULARLY FOR DIRECT INJECTION DIESEL ENGINES

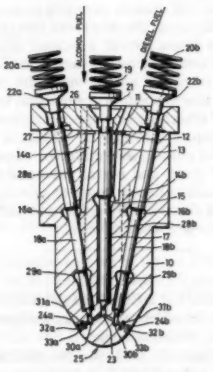
Herbert Wiegand, Cologne, and Klaus Bäumer, Bonn, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,264

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243175

Int. Cl.³ F02B *75/12, 23/06*

U.S. Cl. 123—1 A **18 Claims**



1. A method for the injection of fuel for direct injection diesel engines, said engines having an injection pump and using alternative alcohol fuels and diesel fuel, in which at the end of the compression cycle during an injection process diesel fuel

and alcohol fuel are injected from a multihole nozzle, said method comprising:

in the first phase injecting the diesel fuel having ignition qualities for the purpose of starting the combustion and raising the temperature level in the cylinder room;

in the second phase injecting a two-fuel mixture consisting of diesel and alcohol fuel for the purpose of achieving gentle ignition with continuous combustion; and

in the third phase injecting diesel fuel so that at the end of the injection process no more alcohol fuel having poor ignition qualities reaches the combustion chamber, and wherein the first and third phases are very short compared with the second phase.

4,499,862

INJECTION DEVICE FOR DIRECT INJECTION DIESEL ENGINES USING ALCOHOL AND DIESEL FUEL

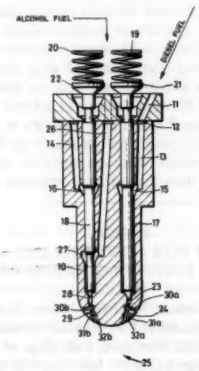
Klaus Bäumer, Bonn, and Herbert Wiegand, Cologne, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,265

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243176

Int. Cl.³ F02B *75/12, 23/06*

U.S. Cl. 123—1 A **12 Claims**



1. In an injection device for direct injection diesel enginer using an injection ppump, wherein at the end of the compression stroke diesel fuel is injected from a spray aperture and alcohol fuel is injected from one or more spray apertures into the combustion chamber, the improvement comprising:

means for injecting the diesel fuel, which has good ignition qualities, chronologically before and chronologically after the start and end of injection for the alcohol fuel, which does not have good ignition qualities, so that during the entire injection process the diesel fuel is available as an ignition aid for the alcohol fuel.

4,499,863

METHOD OF OPERATING AN INTERNAL COMBUSTION ENGINE ON A METHANOL FUEL

Haren S. Gandhi, Farmington Hills, Mich., and William L. H. Watkins, Toledo, Ohio, assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 4, 1982, Ser. No. 439,154

Int. Cl.³ F02M *27/02*

U.S. Cl. 123—3 **6 Claims**

1. A method of operating an internal combustion engine having combustion chambers on a methanol fuel which is characterized by the steps of:

heating at least a portion of the methanol fuel to a temperature at which at least a portion of said heated methanol fuel is vaporized;

heating at least a portion of said vaporized methanol fuel to a decomposition temperature;

passing at least a portion of said vaporized methanol fuel at said decomposition temperature over a catalyst selected from the group consisting essentially of a palladium catalyst, a platinum/palladium catalyst, and a palladium/-rhodium catalyst, thereby to decompose at least part of said vaporized methanol fuel into hydrogen and carbon monoxide;

TEMPERATURE FOR METHANOL DECOMPOSITION

CATALYST DESCRIPTION	T (°C) FOR METHANOL DECOMPOSITION				
	25%	50%	75%	90%	95%
Ni O (Ni = 1 wt %)	340	398	625	N.R.	N.R.
3% CuO + 1.5% ZnO + 0.2% Cr_2O_3	290	450	625	N.R.	N.R.
Ag (0.5 wt %)	285	600	N.R.	N.R.	N.R.
Pt + Pd = 0.1 wt %, ($Pt_{75}Pd_{25}$ = %)	290	325	400	475	N.R.
Pt + Rh = 0.2 wt %, ($Pt_{90}Rh_{10}$ = %)	250	280	330	380	410
Pt + Rh = 0.1 wt %, ($Pt_{90}Rh_{10}$ = %)	265	295	320	370	N.R.
Pd = 0.2 wt %	275	300	340	405	490

N.R. = NOT REACHED

injecting said vaporized methanol fuel along with said hydrogen and carbon monoxide which are the decomposition products thereof into the combustion chambers of the internal combustion engine along with oxygen and, if desired, additional methanol fuel to be burned in the combustion chambers;

burning the fuel and decomposition products thereof confined within the combustion chambers; and

exhausting from the combustion chambers exhaust gases generated by said burning of said fuel and decomposition products thereof.

4,499,864

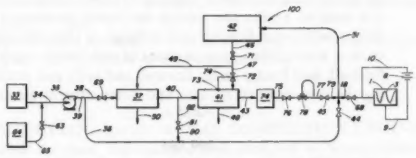
HYDRIDE COLD START CONTAINER IN FUEL TREATMENT AND DISTRIBUTION APPARATUS AND METHOD

Dale R. Lovercheck, and George P. Curran, both of Pittsburgh, Pa., assignors to Conoco Inc., Wilmington, Del.

Filed Feb. 10, 1983, Ser. No. 465,397

Int. Cl.³ F02B *43/08*

U.S. Cl. 123—3 **10 Claims**



1. A method for starting and operating an internal combustion engine comprising the steps as follows:

(a) providing a fuel distribution means in fluid communication with said engine,

(b) providing a hydride containing means in fluid communication with said distribution means, and an electrical resistance heating means adapted to heat said containing means,

(c) providing electrical current source means,

(d) passing electrical current to said electrical resistance heating means from said electrical current source means whereby hydrogen is liberated in said containing means,

(e) passing the thus-liberated hydrogen through said fuel distribution means to said internal combustion engine,

(f) starting said internal combustion engine using said hydrogen as fuel, and

(g) operating said engine on an alternate fuel other than said hydrogen subsequent to said step of starting.

4,499,865

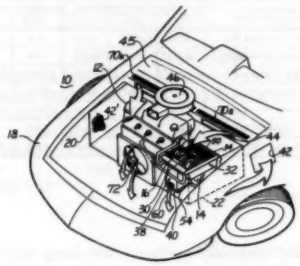
INTEGRAL ENGINE COOLING SYSTEM

Herbert N. Charles, Chatham, Canada, assignor to Canadian Fram Limited, Chatham, Canada

Filed Jan. 24, 1983, Ser. No. 460,105

Int. Cl.³ F01P *3/18*

U.S. Cl. 123—41.05 **3 Claims**



1. A cooling system for use with an automotive engine and an associated engine driven flywheel, said engine and flywheel positioned forwardly of a passenger compartment, comprising:

centrifugal blower means fitted to and rotatable with the flywheel for developing a pressure differential thereacross;

a housing enclosing said flywheel and said blower means for defining an air passage having a housing inlet for communicating air to said blower means and an output passage for permitting the discharge of air therethrough;

air cooled heat exchange means connected to and positioned relative to said housing to permit air to flow therethrough by virtue of the operation of said blower means;

damper means positioned within said output passage responsive to at least one engine operating parameter, for controlling the air flow therethrough; and

compartment means for enclosing said blower means and housing and oriented to prohibit the entrance of ram air thereto and including inlet means for receiving non-ram air comprising the fender walls and firewall of an automotive vehicle, a belly pan joining the lower portions of said fender walls and firewall and a hood of the automotive vehicle joining the upper portions of said fender walls and firewall, said fender walls, firewall and belly pan prohibiting the ram entry of air into said compartment means.

4,499,866

CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINE

Yoshinori Hirano, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 15, 1984, Ser. No. 580,424

Claims priority, application Japan, Feb. 17, 1983, 58-21990[U]

Int. Cl.³ F01P *3/02, 3/22*

U.S. Cl. 123—41.21 **5 Claims**

1. In an internal combustion engine

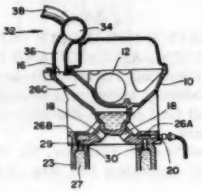
a cylinder block including a first coolant jacket into which coolant is introduced in liquid form and discharged in gaseous form;

a cylinder head removably attached to said cylinder block, said cylinder head including a structure which defines one or more combustion chambers and a second coolant jacket, said second coolant jacket including:

a first port which fluidly communicates with said first coolant jacket;

a chamber defined above the structure defining said one or more combustion chambers and said first port, said chamber being arranged to be filled with liquid coolant to a level which immerses said one or more combustion chamber defining structure;

a plurality of second ports which fluidly communicate with said chamber and through which gaseous coolant is discharged, said second ports being arranged at a level above said chamber and arranged to have a cross section which limits the discharge of liquid coolant from said chamber; and



a vapor manifold mounted on said cylinder head and in fluid communication with said second ports, said vapor manifold including branch runners which each lead from a second port to a reservoir section which has an internal volume larger than said branch runners and which is located at a level above that of said second ports, said branch runners and reservoir section being arranged to cause the fluid flowing from said second ports into said manifold to reduce speed and undergo at least one sharp change in flow direction before reaching the outlet of said manifold, said outlet being arranged to have a cross sectional area less than that of said reservoir section.

4,499,867

ARRANGEMENT FOR CONTROLLING A INTERNAL COMBUSTION ENGINE EQUIPPED WITH GLOW PLUGS

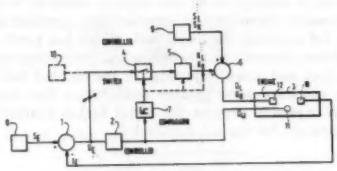
Ernst Linder, Mühlacker; Winfried Moser, Ludwigsburg, and Franz Rieger, Aalen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 610,109

Claims priority, application Fed. Rep. of Germany, May 31, 1983, 3319652

Int. Cl.³ F02D *19/02*

U.S. Cl. 123—145 A **6 Claims**



1. A control arrangement for an internal combustion engine equipped with glow-plug means, the control arrangement comprising:

desired-value generator means for generating a generator signal indicative of the desired ignition time point of combustion in a combustion chamber of the engine;

sensor means for detecting the actual ignition time point of said combustion and providing a sensor signal indicative thereof;

first circuit means responsive to said generator signal and said sensor signal for generating and adjusting a signal

indicative of the heat quantity delivered to said glow-plug means;

comparator means for monitoring said heat-quantity signal and for providing an output signal when said heat-quantity signal falls beneath a predetermined value; and,

second circuit means responsive to said output signal for adjusting a control quantity of the engine.

4,499,868

INTAKE DEVICE OF AN INTERNAL COMBUSTION ENGINE

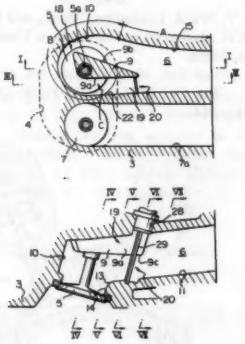
Mutsumi Kanda; Kiyoshi Nakanishi, both of Susono; Tokuta Inoue, Mishima, and Mikio Nakajima, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 2, 1982, Ser. No. 404,145

Claims priority, application Japan, Aug. 3, 1981, 56-120634

Int. Cl.³ F02M *35/10*

U.S. Cl. 123—188 M **23 Claims**



1. An intake device of an internal combustion engine comprising:

an intake valve having a valve stem;

an axially extending intake port passage having an inlet opening at one end thereof and having an outlet opening at the other end thereof, said intake port passage having a substantially cylindrically extending circumferential wall which circumferentially extends about said valve stem, a first side wall which extends between said inlet opening and said circumferential wall along an axis of said intake port passage, a second side wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage and is arranged to face said first side wall, an upper wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage, and a bottom wall which extends between said inlet opening and said circumferential wall along the axis of said intake port passage;

a separating wall projecting downwardly from said upper wall and spaced from said bottom wall, said separating wall extending along the axis of said intake port passage and being spaced from said circumferential wall for defining a helical portion having a helix terminating portion between said separating wall and said circumferential wall, said separating wall being spaced from said first side wall for defining therebetween an inlet passage portion tangentially connected to said helical portion, said separating wall being spaced from said second side wall for defining therebetween a bypass passage which interconnects said inlet passage portion to said helix terminating portion;

normally closed valve means arranged in said bypass passage for controlling the flow area of said bypass passage; and

actuating means for actuating said valve means in response to the change in the operating condition of the engine to open said valve means when the engine is operating at a high speed under a heavy load.

4,499,869

RECIPROCATING INTERNAL COMBUSTION ENGINE

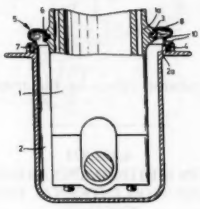
Tomas Visek, Steyr, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Feb. 8, 1984, Ser. No. 578,202

Claims priority, application Austria, Feb. 10, 1983, 454/83

Int. Cl.³ F02F *7/00*

U.S. Cl. 123—195 C **6 Claims**



1. In a reciprocating internal combustion engine comprising

an outer pan having a peripherally extending, annular top edge portion formed with a peripherally extending first annular groove having confronting side faces,

an engine block mounted in said outer pan and formed in its outside peripheral surface with a peripherally extending second annular groove having confronting side faces, and

a flexible frame-shaped oil seal surrounding said engine block and extending into said first and second annular grooves in sealing contact with said side faces,

the improvement residing in that

said oil seal comprises first and second fins extending into said first and second grooves, respectively, throughout the length thereof and a frame-shaped flexible profiled connecting portion, which connects said fins throughout the length thereof and has in cross-section an outwardly convex portion, which protrudes laterally outwardly above said top edge portion,

each of said fins has side faces formed with a plurality of transversely deflectable, longitudinal ribs in sealing contact with said side faces of the associated one of said grooves,

the thickness of each of said fins, inclusive of said ribs, in an unstressed condition exceeds the width of the associated groove, and

the thickness of said flexible connecting portion is smaller than the thickness of each of said fins.

4,499,870

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Shunichi Aoyama, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

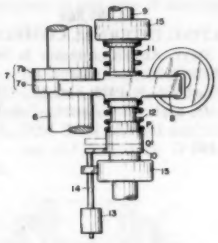
Filed Apr. 26, 1983, Ser. No. 488,688

Int. Cl.³ F02D *13/06*

U.S. Cl. 123—198 F **6 Claims**

1. A multi-cylinder internal combustion engine comprising at least one cylinder having an intake valve and an exhaust valve and being adapted to operate under partially and fully loaded conditions, at least one cylinder having an intake valve and an exhaust valve and being adapted to be inoperative under said partially loaded condition, an axially fixed camshaft, and controlling means which, under said partially loaded condition, continuously closes the intake valve of the inoperative cylinder and periodically opens the exhaust valve of the inoperative cylinder on the exhaust stroke and on the intake stroke of the inoperative cylinder, said controlling means comprising at least four cams having different profiles and fixed to said

camshaft and at least two rocker arms each of which is displaceable for selectively contacting one of said cams to control



the intake and exhaust valves of the inoperative cylinder, respectively.

4,499,871

FUEL INJECTION METHOD AND ARRANGEMENT FOR DIRECT-INJECTION INTERNAL COMBUSTION ENGINES

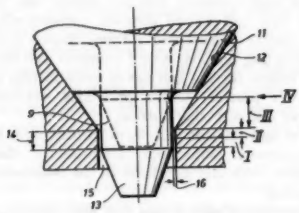
Alfred Neitz, Röthenbach; Nunzio D'Alfonso, and Hans Pickel, both of Nuremberg, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Ausburg-Nürnberg AG, Nuremberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 334,003, Dec. 23, 1981, abandoned, which is a continuation of Ser. No. 154,107, May 28, 1980, abandoned. This application Aug. 4, 1983, Ser. No. 520,147

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1979, 2923670

Int. Cl.[3] **F02B** *3/04;* **F02D** *5/06*

U.S. Cl. 123—276 **30 Claims**



1. An air-compression, direct-injection internal combustion engine with compression-ignition or spark-ignition comprising:

(a) a cylinder;

(b) a piston reciprocable in said cylinder and having a crown, said crown being provided with a combustion chamber having the shape of a body of rotation, and said crown defining a wall which surrounds said combustion chamber;

(c) admitting means for admitting air into said combustion chamber, said admitting means being arranged to generate an air swirl in said combustion chamber which circulates about the axis of the latter;

(d) fuel injection means for injecting fuel into said combustion chamber, said injection means being provided with a fuel discharge passage and including a member movable between a closed position of said passage and a plurality of open positions of said passage, and said injection means being designed such that the effective cross-sectional area of said passage varies during movement of said member between said positions; and

(e) control means for controlling said member so as to regulate the quantity of fuel which is injected into said combustion chamber as a function of at least one of the parameters load and speed of said engine, said control means being designed to move said member in such a manner that at least the predominant part of the fuel impinges upon said wall within the upper range of said one parameter to subsequently evaporate from said wall and mix with the air while at least the predominant part of the fuel mixes directly with the air during idling as well as in the lower range of said one parameter, and said control means also being designed so that the effective cross-sectional area of said passage in the lower range of said one parameter is maintained between 3 and 15% of the effective cross-sectional area of said passage at maximum output, said injection means and said control means further being designed in such a manner that the maximum injection pressure at said passage at nominal rating is 2 to 3 times the pressure required to open said passage.

4,499,872

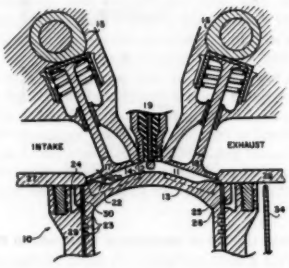
ULTRA LEAN BURN CARBURETTED ADIABATIC ENGINE

Michael A. V. Ward, Lexington, Mass., and Robert P. Lefevre, Dover, N.H., assignors to Combustion Electromagnetics, Inc., Arlington, Mass.

Filed Jan. 10, 1983, Ser. No. 456,612

Int. Cl.[3] **F02D** *13/02;* **F02P** *15/02*

U.S. Cl. 123—344 **31 Claims**



1. Internal combustion engine apparatus comprising:

(a) means defining at least one compression/expansion chamber,

(b) a movable compression/expansion element moveable within such chamber,

said parts (a) and (b) being constructed and arranged to provide cyclic compression and expansion of a combustion space within such chamber through regular cyclic movement of such members,

(c) means for providing a very lean air and fuel mixture with an average precombustion equivalence ratio Φ of less than 0.75 in all but high load/acceleration conditions

(d) means for admitting air and fuel to such space,

(e) electrical means for igniting, combined with means for stimulating combustion of, said very lean mixture, such that on the average the real fuel ideal otto cycle mean gas ranking temperature T_g for this engine is within two thirds and four fifths that of the "conventional standard" engine ($T_g = \frac{2}{3} T_g$),

(f) means for exhausting combustion gas from such chamber space,

(g) means for extracting work from the expansion driven movement of said moveable member and returning work for compression movement thereof, and

(h) means for limiting cooling of the chamber walls adjacent to the combustion space,

the apparatus as a whole being constructed and arranged to enable essentially adiabatic operation of the engine.

18. A method for operation of an internal combustion power system of the type utilizing a multi-cylinder engine housing with pistons movable in cylinders and connected to a work-

extracting drive system arranged for extracting work from the pistons in cyclic alteration on expansion strokes thereof, caused by combustion of an air/fuel mixture; and returning work to the pistons to drive them in, cyclic alternation, in compression strokes comprising the steps of:

(a) controlling the air/fuel mixture to a lean condition of equivalence ratio Φ of less than 0.75 except under engine high load/acceleration,

(b) limiting the burn time of said mixture by a factor of at least two compared to the burn time of that mixture with conventional single point spark ignition and no microwave stimulation in a similar chamber with liquid cooling,

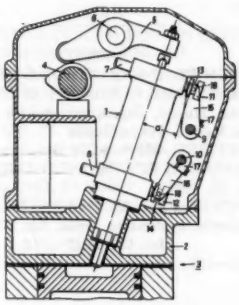
(c) retaining heat left in the combustion zone after expansion and imparting such heat from a previous expansion to air/fuel mixture admitted in a next compression step, to preheat mixture in such compression step to aid in the reduction of the burn time, except under high load/acceleration conditions.

4,499,873

CONTROL ROD SYSTEM FOR FUEL INJECTION DEVICES FOR DIESEL ENGINES

Gerhard Lehner, Hallein, Austria, assignor to Friedmann & Maier Aktiengesellschaft, Friedmannstrasse, Austria

Filed Jan. 12, 1981, Ser. No. 224,449
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—372 **4 Claims**



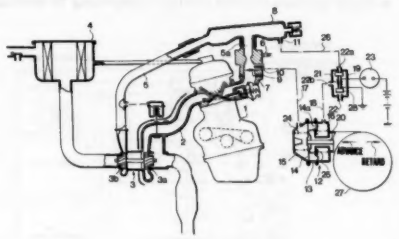
1. Control rod system for fuel injection devices for Diesel engines having cylinders arranged in at least one row having a longitudinal axis, of the type in which fuel injection pump and fuel injection nozzle are combined in one pump-nozzle-unit associated with one engine cylinder each, the unit including a housing and two axially shiftable control rods integrated with the pump-nozzle-unit and influencing different operational parameters, the integrated control rods being adapted to be coupled with control members arranged on the engine, characterized in that, the control members arranged on the engine are designed as control shafts rotatably supported in parallel relation to the longitudinal axis of the engine, in that the control rods are guided within the housing of the pump-nozzle-unit for being shifted in approximately perpendicular direction to the longitudinal axis of the engine, in that lever arms are arranged on the control shafts and designed for engaging slide pieces arranged on the control rods in that the control rods are, as seen in axial direction of the pump-nozzle-unit, laterally offset one with respect to the other and in that, as seen in axial direction of the pump-nozzle-unit at least the slide piece of the control rod located less remote from the nozzle is with the control rod retracted not overlapping at least the control shaft located more remote from the nozzle.

4,499,874

SYSTEM FOR CONTROLLING THE IGNITION TIMING OF AN ENGINE

Katsuhiko Sugiura, Tama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,573
Claims priority, application Japan, Mar. 7, 1983, 58-37185
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—407 **3 Claims**



1. A system for controlling the ignition timing of an engine provided with a distributor, a throttle valve, and a supercharger having a compressor provided in an intake passage of the engine, comprising;

a vacuum advance device comprising two chambers defined by at least one diaphragm and a rod connecting said diaphragm to an advance mechanism of said distributor;

a signal port provided in the wall of said intake passage at a position the pressure at which varies with the variation of the opening degree of said throttle valve;

a first passage communicating one of said chambers with said signal port;

three-way valve means having three ports,

said three-way valve means having a first port communicated with the other chamber of said vacuum advance device, a second port communicated with said intake passage at the upstream side of the throttle valve, and a third port communicated with the atmosphere;

means responsive to temperature for operating said three-way valve means so as to open said third port and to close said second port at temperature higher than a predetermined temperature and to close said third port and to open said second port at temperature lower than said predetermined temperature where knocking hardly occurs,

said vacuum advance device being so arranged that said diaphragm is deflected by the pressure in the intake passage in the advance direction at said lower temperature conditions.

4,499,875

CONTROL UNIT MODIFIABLE ENGINE IGNITION CONTROL APPARATUS

Hiroomi Katayama, Machida; Yoshiaki Hirosawa, Shiki, and Masahiko Fujii, Yokohama, all of Japan, assignors to New Nippon Electric Co., Ltd., Osaka and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Oct. 12, 1982, Ser. No. 433,911
Claims priority, application Japan, Oct. 12, 1981, 56-160914
Int. Cl.³ F02P *5/00*
U.S. Cl. 123—416 **10 Claims**

1. An engine ignition control apparatus for an engine with a crank, comprising:

N reference position sensors, positionable next to the engine, for sensing the position of the engine and for generating reference position signals therefrom, where N is greater than or equal to 1;

a crank angle sensor, positionable next to the engine crank, for sensing the angle of the engine crank and for generating crank angle signals therefrom;

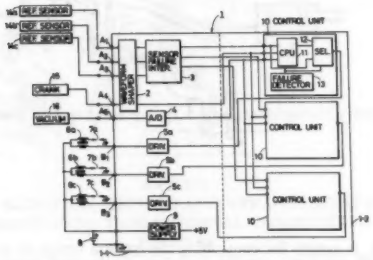
a vacuum sensor, operatively connectable to the engine, for generating a vacuum signal;

waveform shaping means, operatively connected to said crank angle sensor and said N reference position sensors, for shaping the crank angle and reference position signals;

interpolation means, operatively connected to said waveform shaping means, for interpolating the reference position signals when one or more of the N reference position sensors fail; and

a single ignition control module comprising N interchangeable control means, operatively connected to said waveform shaping means, said interpolation mans and said vaccum sensor and each corresponding to a respective one of said N reference position sensors, for generating ignition control signals, each of said N control means generating respective ignition control signals in dependence upon the crank angle signal, the respective reference position signal and the vacuum signal; and

N ignition assemblies, each operatively connected to the respective one of said N control means, for providing engine ignition.



4,499,876

FUEL INJECTION CONTROL FOR INTERNAL COMBUSTION ENGINES

Yoshihisa Yamamoto, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 30, 1982, Ser. No. 428,619

Claims priority, application Japan, Oct. 30, 1981, 56-173833; Jan. 20, 1982, 57-7199

Int. Cl.³ F02B *77/00*

U.S. Cl. 123—446 **9 Claims**

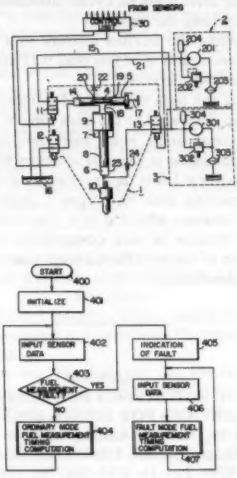
1. A method of controlling the injection of fuel into an internal combustion engine having a plurality of unit injectors provided one for each cylinder of the engine and each responsive to electric signals to control the injection of fuel therefrom, said method comprising the steps of:

detecting an operating condition of said engine by sensor means;

discriminating the presence or absence of a malfunction in the injection of fuel from each said injector in accordance with said engine operating condition detected by said sensor means; and

supplying, upon discrimination of a malfunction in the injector of any one of said cylinders, to said malfunctioning injector electric control signals which are required for continued operation of said engine but different from those required for a normal operation of said engine,

wherein said control signal supplying step supplies electric control signals for cutting off the injection of fuel to said malfunctioning injector and the injector of at least one of said cylinders has a particular order of arrangement relation with the order of arrangement of the other one of said cylinders associated with said malfunctioning injector from the standpoint of balance in the generation of power output.



4,499,877

IGNITION TIMING CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Toshio Iwata, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

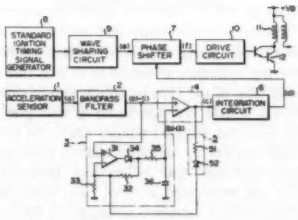
PCT No. PCT/JP81/00096, § 371 Date Dec. 8, 1981, § 102(e) Date Dec. 8, 1981, PCT Pub. No. WO81/03049, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 23, 1981, Ser. No. 329,352

Claims priority, application Japan, Apr. 23, 1980, 55-55682

Int. Cl.³ F02P *5/14*

U.S. Cl. 123—425 **10 Claims**



1. An ignition timing control device for an internal combustion engine of a vehicle, which comprises:

a signal generating means for generating a standard ignition timing signal;

a vibration detecting means for generating a signal having a noise signal component and a knocking signal component, said signal being generated in response to the vibrations of said engine;

a noise level detecting means for generating a comparative signal in response to said noise signal component, said comparative signal normally being larger in value than said noise signal component;

a comparator, having one input which is connected to an

output of said vibration detecting means and having another input which is connected to an output of said noise level detecting means, for comparing said signal from said vibration detection means with said comparative signal from said noise level detecting means, and for preventing said noise signal component from passing therethrough, thereby allowing only said knocking signal component to appear at its output;

an integration circuit whose input is connected to said output of said comparator for integrating said knocking signal component on said output of said comparator;

a phase shifting means for controlling a phase retard angle of said standard ignition timing signal in response to said integrated knocking signal component on an output of said integrator; and

a switching means connected to an output of said phase shifting means, for intermittently interrupting a power supply which is connected to an ignition coil of said vehicle in response to a phase retarded ignition timing signal from said phase shifting means, so as to thereby eliminate knocking in said engine;

further comprising:

a feedback means for preventing said noise signal component from erroneously appearing on said output of said comparator when said noise signal component continues to appear on said output of said comparator for a predetermined time.

4,499,878

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

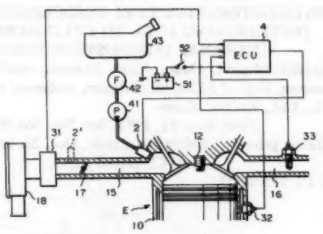
Toshihiko Igashira, Toyokawa; Taro Tanaka, Nagoya, and Yasuyuki Sakakibara, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 21, 1983, Ser. No. 544,417

Claims priority, application Japan, Oct. 25, 1982, 57-187157; Jul. 2, 1983, 58-119489; Jul. 11, 1983, 58-124823; Aug. 12, 1983, 58-146731; Aug. 20, 1983, 58-152059

Int. Cl.³ F02M *51/04, 51/02, 39/02*

U.S. Cl. 123—478 **10 Claims**



1. A fuel injection system for an internal combustion engine comprising:

a unit injector for compressing the fuel and injecting a predetermined amount of the fuel, said unit injector including an actuator adapted to be expanded or compressed with a predetermined stroke in response to a supplied voltage, a piston for taking in fuel to a pump chamber and compressing said taken-in fuel, and an injection valve for injecting said compressed fuel; and

electronic control means for controlling, independently of the rotation of the engine, the frequency of the voltage supplied to said actuator and controlling accordingly the amount of fuel injection in accordance with the frequency of the voltage supplied to said actuator.

4,499,879

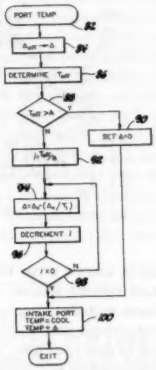
FUEL SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Donald D. Stoltman, Henrietta, and Gary A. Nichols, Rochester, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 28, 1983, Ser. No. 489,696

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—480 **3 Claims**



1. A system for providing the fuel requirements of an internal combustion engine cooled by a liquid coolant circulated therethrough and having an air-fuel intake region whose temperature increases to a value above the coolant temperature during engine operation, the system comprising:

means effective to sense the coolant temperature;

means effective to generate an estimated temperature signal having a value representing an estimated temperature of the air-fuel intake region, the last mentioned means (A) determining the value of the estimated temperature signal in accord with a predetermined engine operation schedule based on the elapsed time of engine operation and the sensed coolant temperature and (B) determining the value of the estimated temperature signal in accord with a predetermined engine shut down schedule based on the elapsed time of engine shut down and the sensed coolant temperature; and

means effective to supply fuel to the air-fuel intake region in accord with the value of the estimated temperature of the air-fuel intake region.

4,499,880

AIR-FUEL RATIO CONTROLLING APPARATUS FOR INTERNAL COMBUSTION ENGINE

Masayuki Miki, Katsuta; Seikou Suzuki, Hitachiota, and Takao Sasayama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1982, Ser. No. 439,878

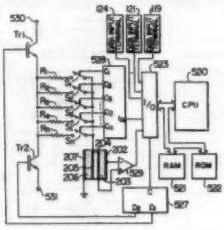
Int. Cl.³ F02M *7/18*

Claims priority, application Japan, Nov. 11, 1981, 56-179772

U.S. Cl. 123—489 **3 Claims**

1. In an air-fuel ratio controlling apparatus for internal combustion engines, comprising means for supplying fuel in accordance with the operation parameters of the internal combustion engine, an exhaust gas sensor including a pump cell, a sensor cell and a reference gas layer formed hermetically between said sensor cell and said pump cell for producing an electrical output in accordance with the oxygen in the exhaust gas, and control means for controlling at least selected one of the fuel and the air supplied to the internal combustion engine in accordance with the output of said exhaust gas sensor, so that the mixture gas supplied to the internal combustion engine is controlled to a predetermined air-fuel ratio; the improve-

ment further comprising operating mode detector means for detecting the operating mode of the internal combustion engine, and setting means for setting the oxygen concentration of said reference gas layer to a predetermined concentration in accordance with the output of said operating mode detector means, wherein said setting means includes pump cell drive means for controlling the electric charges supplied to said pump cell, said pump cell drive means including a current



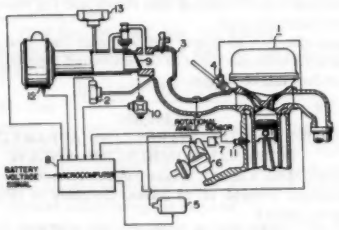
source and current source drive means for determining the drive time of said current source, and wherein said current source drive means includes integrator means for integrating the output of said current source, comparator means for comparing the output of said integrator means with an integration target value corresponding to a setting of the oxygen concentration of the reference gas layer, and means for cutting off said current source in accordance with the output of said comparator means.

4,499,881

METHOD AND APPARATUS FOR CONTROLLING INTERNAL COMBUSTION ENGINES

Mitsunori Takao, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed May 14, 1982, Ser. No. 378,394
Claims priority, application Japan, May 18, 1981, 56-74626
Int. Cl.³ F02B 3/00
U.S. Cl. 123—492 **8 Claims**



1. A method of controlling a quantity of fuel supply to an internal combustion engine comprising the steps of:

(a) sampling at least one of controlling factors indicative of load conditions of said engine at intervals of a given period to obtain an incremental or decremental amount of change of said controlling factors;

(b) obtaining a change in the amount of change of said controlling factors at predetermined sampling intervals; and

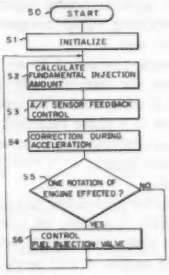
(c) obtaining data for correcting said controlling factors for controlling the quantity of fuel supply to said engine in accordance with the amount of change of said controlling factors and the change in the amount of change of said controlling factors.

4,499,882

SYSTEM FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Kimitaka Saito, Okazaki; Tokio Kohama, Nishio; Tsuneyuki Egami, Aichi; Tsutomu Saito, Okazaki; Susumu Nogami, and Yukio Suzuki, both of Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 29, 1983, Ser. No. 566,815
Claims priority, application Japan, Jan. 14, 1983, 58-3288
Int. Cl.³ F02B 3/00
U.S. Cl. 123—492 **9 Claims**



1. A system for controlling the air-fuel ratio in an internal combustion engine comprising:

a transient fuel amount increasing means for regulating the supply fuel amount in the transient state of the engine on the basis of the detection of the transient state of the engine;

an air-fuel ratio deviation detecting means for detecting the deviation of the air-fuel ratio in the transient state of the engine from the optimum air-fuel ratio; and

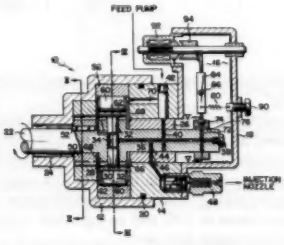
a transient fuel increase amount correcting means for correcting the fuel increase amount in the transient state of the engine in accordance with the air-fuel ratio deviation detected by said air-fuel ratio deviation detecting means.

4,499,883

DISTRIBUTOR TYPE FUEL-INJECTION PUMP FOR DISTRIBUTING FUEL TO CYLINDERS OF AN INTERNAL COMBUSTION ENGINE

Masahiko Miyaki, Oobu; Akira Masuda, and Toshimi Matsumura, both of Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 22, 1983, Ser. No. 564,408
Claims priority, application Japan, Dec. 26, 1982, 57-228567
Int. Cl.³ F04B 19/00
U.S. Cl. 123—503 **8 Claims**



1. A distributor type fuel-injection pump for distributing fuel to individual cylinders of an internal combustion engine, comprising:

a housing;

a rotor disposed in the housing and rotated by the engine, said rotor having therein a cylindrical bore extending at right angles to the axis of said rotor, a fuel passage opening into the cylindrical bore and extending along the axis of said rotor, and spill holes as many as the engine cylinders, opening into the fuel passage and having ports circumferentially arranged at regular intervals on the outer peripheral surface of said rotor;

a pair of plungers slidably fitted in the cylindrical bore of said rotor, opposed end faces of said plungers defining a fuel pumping chamber in the cylindrical bore;

fuel supply means for supplying fuel to said fuel pumping chamber;

cam means engaging the two plungers in said housing, said cam means being adapted to reciprocate both said plungers in the cylindrical bore as said rotor rotates, whereby a fuel pressurization process is repeated at a frequency equivalent to the number of the engine cylinders for each revolution of said rotor;

distribution/delivery means for distributing and delivering the fuel pressurized in the fuel pumping chamber to the individual engine cylinders through the fuel passage;

a control sleeve fitted on the outer peripheral surface of said rotor so as to be able to slide along the axis of said rotor, said control sleeve having on the inner peripheral surface thereof first and second spill grooves capable of communicating with each of the spill holes, at least one end of each the spill groove opening to the outer side face of said control sleeve, the circumferential distance between the first and second spill grooves varying along the axis of said rotor, whereby the opening and closing of the spill holes in each fuel pressurization process are controlled by the first and second spill grooves, so that the timing for the start of fuel delivery and the timing for the end of fuel delivery, which define the amount of fuel delivery, are determined in each fuel pressurization process; and

adjusting means for moving said control sleeve along the axis of said rotor to adjust the amount of fuel delivery.

4,499,884

FUEL INJECTION PUMPS

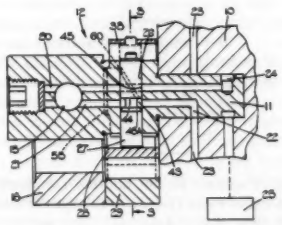
Robert T. J. Skinner, High Wycombe, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Nov. 14, 1983, Ser. No. 551,161

Claims priority, application United Kingdom, Dec. 8, 1982, 8235049

Int. Cl.³ F02M *41/08, 37/04*

U.S. Cl. 123—506 **12 Claims**



1. A rotary distributor type fuel injection pump for supplying fuel to internal combustion engines more particularly of the compression ignition type, the pump comprising a rotary distributor member mounted in a pump body and arranged in use to be driven in timed relationship with the associated engine, a pump bore formed in the distributor member, a reciprocable pumping plunger slidable in the pump bore, cam means including a cam lobe for effecting inward movement of the pumping plunger as the distributor member rotates, a delivery passage in the distributor member and an outlet port in the body, said delivery passage communicating with said pump bore and being positioned to register with said outlet when fuel is displaced from said pump bore, means for supplying fuel to said pump bore and fuel control means for controlling the amount of fuel supplied to said outlet, said fuel control means including a valve member carried by the distributor member and further cam means for actuating said valve member, said valve member when in an operative position causing fuel to spill from said pump bore, said valve member being slidable in a radial bore in the distributor member, a pair of ports opening into said bore at axially spaced positions, one of said ports communicating with said delivery passage and the other port with a low pressure, said valve member being of cylindrical form having a groove intermediate its ends, said groove communicating with said pump bore, the arrangement being such that when the valve member is in its inoperative position said one port will be open to said groove and the pump bore but in the operative position of the valve member, said other port will be open to said groove to allow fuel to spill from the bore, the one port during movement of the valve member to its operative position being progressively covered to control the rate at which fuel can flow from said outlet.

4,499,885

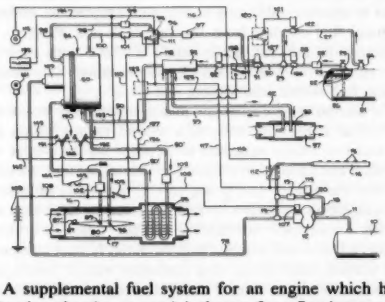
SUPPLEMENTAL SYSTEM FOR FUEL AGENCY

Joseph Weissenbach, deceased, late of Los Angeles, Calif., and by Jane A. Shahrokh-Khani, executor, 1472½ Morton Pl., Los Angeles, Calif. 90026

Continuation of Ser. No. 441,808, Nov. 2, 1982, abandoned, and a continuation-in-part of Ser. No. 36,496, May 7, 1979, abandoned, Continuation-in-part of Ser. No. 664,479, Mar. 8, 1976, abandoned, and Ser. No. 263,708, May 14, 1981, abandoned. This application Aug. 30, 1983, Ser. No. 527,874

Int. Cl.³ F02M *13/08*

U.S. Cl. 123—525 **63 Claims**



1. A supplemental fuel system for an engine which has a combustion chamber, a conduit thereto for a flowing combustion air supply, a primary source for primary fuel, primary delivery means between said primary source and said combustion chamber, and primary fuel pressure means for said primary delivery means, a supplemental source for a supplemental fuel agency including a supplemental delivery means between said supplemental source and said air supply, and an automatic flow control means in said supplemental delivery means for establishing an initial open flow condition therein, a temperature moderator for said supplemental delivery means responsive to temperature of said air supply for moderating the temperature of said supplemental fuel agency, a main electrical circuit for said primary fuel pressure means having an ignition switch therein, adjusting means in said electrical circuit for establishing flow conditions in said primary delivery means and automatic compensating means for regulating the flow condition in said supplemental delivery means reponsive to the flow condition in said primary delivery means.

4,499,886

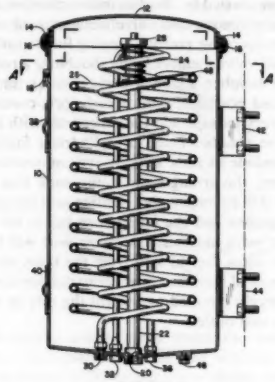
DIESEL FUEL HEATER

Kenneth W. Hinds, Rte. 4, Box 474, Springdale, Ark. 72764

Filed Jun. 10, 1982, Ser. No. 386,887

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 4 Claims



1. In a diesel engine containing a fuel tank with diesel fuel and crankcase with oil, the specific improvement consisting of an apparatus to heat fuel comprising:

(a) a closed container equipped with an oil inlet and oil outlet and adapted to circulate hot crankcase oil from the engine through the interior of said closed container wherein said closed container is an essentially vertical cannister with removable lid;

(b) a first heat exchanger means comprising essentially vertical concentric coils of a first tubing wherein said first heat exchanger means is within said closed container attached to a separate inlet and outlet and adapted to circulate diesel fuel coming from the fuel tank and going to the engine in indirect liquid/liquid contact with said hot crankcase oil within said closed container thus heating said fuel before combustion; and

(c) a second heat exchanger means comprising essentially vertical concentric coils of a second tubing within said closed container attached to another separate inlet and outlet and adapted to circulate excess diesel fuel, recycled from the engine and going to the fuel tank, in indirect liquid/liquid contact with said hot crancase oil within said closed container thus heating said fuel being returned to the fuel tank and wherein said oil outlet further comprises a vertical tube within said container which rises within said container to a level above the top of said coils and terminates in a means to control the rate of oil flow through the container during operation of the engine.

4,499,887

DUAL FUEL SUPPLY SYSTEM

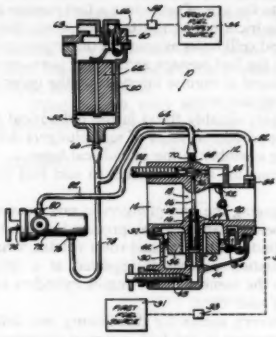
Henry C. Billingsley, Waukegan, Ill., and Amos M. Clark, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 28, 1983, Ser. No. 461,866

Int. Cl.³ F02M *13/04*

U.S. Cl. 123—575 10 Claims

1. A fuel supply system comprising a carburetor including an fuel/air induction passage having means defining a low pressure zone, a secondary orifice communicating with said induction passage downstream of said low pressure zone, a cavity communicating with said secondary orifice, first fuel supply means including a source of a first fuel and means operable to simultaneously supply the first fuel to said low pressure zone and to said cavity, and second fuel supply means including a



source of a second fuel and means operable to supply the second fuel to said cavity simultaneously with the first fuel.

4,499,888

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

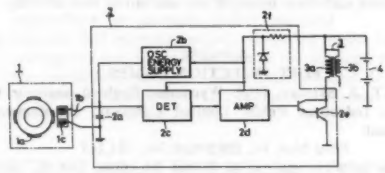
Toshiyuki Hino, and Katsuyoshi Masuno, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

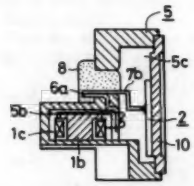
Filed Sep. 29, 1982, Ser. No. 427,099

Claims priority, application Japan, Oct. 1, 1981, 56-146935[U]

Int. Cl.³ F02D *7/00*

U.S. Cl. 123—615 6 Claims





1. An ignition system for an internal combustion engine, comprising: a signal rotor (1*a*) driven in synchronism with an internal combustion engine, a core (1*b*) disposed in confronting relation to said rotor and having a coil (1*c*) wound thereabout, a capacitor (2*a*) connected to said coil to form a resonant circuit therewith, a supply circuit (2*b*) for supplying said resonant circuit with oscillation energy, a threshold detector circuit (2*c*) for detecting the condition of oscillation of said resonant circuit, an amplifier (2*d*) for amplifying an output signal from said detector circuit, a switching element (2*e*) driven by an output signal from said amplifier, an ignition coil (3) for generating a high voltage in response to intermittent operation of said switching element, and a single casing having

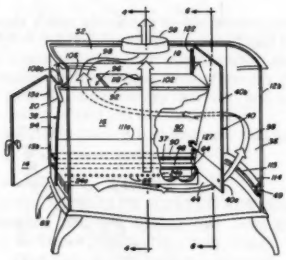
an open end, said casing including a first housing portion (5*a*) accommodating said core and coil, and a second housing portion (5*c*) communicating with said first housing portion and accommodating an electronic circuit unit (2) including said capacitor, oscillation energy supply circuit, oscillation detector circuit, amplifier and switching element.

4,499,889

METHOD AND APPARATUS FOR IMPROVED CONSTRUCTION OF FUEL BURNING HEATING ASSEMBLIES

Duncan C. Syme, Chelsea, Vt., assignor to Vermont Castings, Inc., Randolph, Vt.

Filed Jun. 18, 1980, Ser. No. 160,548
Int. Cl.³ F24C *1/08*
U.S. Cl. 126—75 **17 Claims**



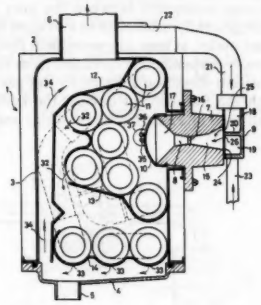
1. A fuel burning heating apparatus comprising
a heat conducting frame having a door,
a baffle assembly,
said frame enclosing said baffle assembly, and said baffle assembly in combination with said frame defining
a front primary combustion chamber further defined in part by said door and accessible therethrough,
a rear secondary combustion chamber behind and in gaseous communication with said primary combustion chamber,
an opening at a bottom portion of said apparatus connecting said primary and secondary combustion chambers for said gaseous communication therebetween, and
a flue gas exit path from said secondary combustion chamber to an exit aperture in said frame,
said baffle assembly having at least one vertically oriented fireback assembly exposed to said primary chamber from a combustion region of said chamber to a region of said chamber spaced from said combustion region,
said fireback assembly having at least two abutting elements, a first of said elements being adjacent said combustion region and a second of said elements being spaced from said combustion region, said elements being in a substantially sealing relationship with each other along adjacent touching surfaces, and said elements having a mechanical interrelationship which allows said first element to exapnd, as a result of thermal heating, independently of said second element,
tab means for holding said elements together while allowing relative rotation therebetween about the line along which said elements meet, and
said exit aperture being at a top portion of said frame and in gaseous communication with said flue gas exit path for providing an exit port for combustion products.

4,499,890

HEATER AND A METHOD OF CONTROLLING THE COMBUSTION IN SUCH A HEATER

Gerard C. Meulenbrug, Deventer, Netherlands, assignor to Nederlandse Industriële Maatschappij NEFIT N.V., Deventer, Netherlands

Filed Oct. 16, 1981, Ser. No. 311,949
Claims priority, application Netherlands, Oct. 16, 1980, 8005717
Int. Cl.³ F24H *3/00*
U.S. Cl. 126—116 R **9 Claims**



1. A heater comprising:
a combustion chamber;
a burner disposed within said combustion chamber for burning fuel;
a heat exchanger arranged within said combustion chamber for heating a heat exchange fluid;
a mixing chamber operatively associated with said burner, said mixing chamber having a converging asymmetrical inlet portion, a throat portion and a diverging outlet portion communicating with said inlet portion via said throat portion;
means for feeding fuel to said burner, said means for feeding fuel connected to said mixing chamber;
means for forcing air into said mixing chamber;
a burner plate provided on said outlet portion of said mixing chamber, said burner plate having a plurality of evenly divided ports formed therein;
a restriction plate having a plurality of calibrated openings formed therein for forming jets of air and fuel and provided on said inlet portion of said mixing chamber;
a feeding device for feeding air and fuel into said inlet portion of said mixing chamber through said restriction plate, said feeding device having a first chamber formed therein connected to said means for forcing air into said mixing chamber and having a separate second chamber formed therein connected to said means for feeding fuel to said burner; and
means for deflecting said jets of air and fuel comprising a whirling space defined by wall portions of said inlet portion of said mixing chamber, a first one of said wall portions extending from said restriction plate and converging more rapidly toward said throat portion than on opposing second one of said wall portions, such that a small flame is produced by said burner.

4,499,891

FLUE CONTROL DEVICE

John W. Seppamaki, 3768 Socorro, Grandville, Mich. 49418

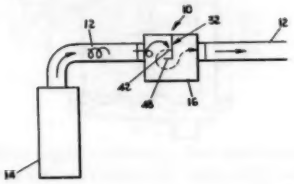
Filed Aug. 29, 1983, Ser. No. 527,329
Int. Cl.³ F23L *3/00*
U.S. Cl. 126—292 **11 Claims**

10. A non-restrictive flue control device for slowing the rate

at which furnace exhaust gases are conveyed through an exhaust stack comprising:

a closed housing having an inlet and outlet at opposite ends thereof, the interior of the housing forming a baffle chamber, the inlet and outlet being formed such that the flue control device can be inserted in a section of the furnace exhaust flue; and

baffle means mounted in the baffle chamber for diverting the exhaust gases into a non-linear path around the baffle means in the housing while at the same time disrupting any circular, swirling movement of the gases and rendering such gas flow turbulent, the baffle means comprising a baffle plate positioned between the inlet and outlet in a position generally transverse to a straight line between the inlet and outlet, at least one prominent flange extending in a generally perpendicular direction from the baffle plate in an upstream direction relative to the gas flow direction through the flue control device, the flange being about one-half inch (1.27 cm) wide or wider and extending the



width of the baffle plate, the flange being positioned such that the flange is generally transverse to the circular, swirling direction of the gases so as to disrupt such circular, swirling movement as the gases are diverted around the baffle plate, the housing being sufficiently large and the baffle means being sufficiently small that the baffle means does not restrict the internal cross-sectional area of the housing to a size smaller than the internal cross-sectional area of the exhaust flue, the baffle means further comprising a second plate at least partially overlapping the baffle plate and attached thereto by fasteners that are at least forcibly removable, the second plate having a prominent flange thereon extending in the same direction as the flange on the baffle plate, the position of the second plate on the baffle plate being adjustable by removing the fasteners, adjusting the relative plate positions and attaching the plates together with fasteners, the adjustment of plate positions making it possible to modify the amount of restriction provided by the baffle means.

4,499,892

ARRANGEMENT FOR SLAT SCREENS FOR SOLAR PROTECTION

Aldo Gasparini, Kungsportsavenyen 34, 411 36 Gothenburg, and Nils-Erik Wimnell, Karl Gustavsgatan 59, 411 31 Gothenburg, both of Sweden

PCT No. PCT/SE82/00217, § 371 Date Feb. 22, 1983, § 102(e) Date Feb. 22, 1983, PCT Pub. No. WO83/00055, PCT Pub. Date Jan. 6, 1983

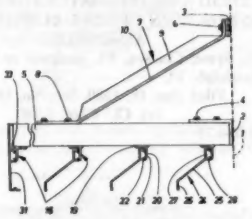
PCT Filed Jun. 16, 1982, Ser. No. 485,130

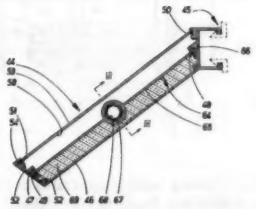
Claims priority, application Denmark, Jun. 23, 1981, 2762/81

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—446 **5 Claims**

1. An arrangement of slat screens for solar protection, comprising: a plurality of elongated slats mounted in spaced relationship to each other on a support and together forming a screen for intercepting the rays of the sun over a predetermined angular zone, each slat being an extruded light metal piece comprising a wide portion forming a plate, side edge portions extending upwardly from said wide portion on opposite sides thereof so as to form a trough, said edge portions having an outer ends thereof away from said wide portion first grooves, a transparent disc accommodated in said grooves so that a closed space is formed in the slat into which the rays of the sun may penetrate through the disc, said side edge portions having second grooves closer to said wide portion than said first grooves, thermally-insulating strips in said second grooves, a plate-shaped unit accommodated in said strips and of extruded light metal, and having a tubular portion for flow of fluid for dissipating the heat formed by solar radiation on the slat to a pipe system for the fluid, said unit dividing the space between the transparent disc and said wide portion into a first space located between the disc and the unit, and a second space located between the unit and said wide portion, and a plate-shaped insulating body in said second space, said support has





slat holders with projections having surfaces which face away from each other and which slope in such a way in relation to each other that together they form an entry portion which opens out from ends of the projections, said entry portion terminating inwardly in a groove in each projection, each slat including a fixture which has two flanges facing each other and having outer hook-shaped projections facing each other, the distance between the flanges being such that the hook-shaped projections offer a widened out entry portion so that upon bending of the flanges they may pass the widest section of the entry portion, which is wider than the distance between the hook-shaped projections, so that after passing the entry portion the hook-shaped projections can snap downwards into said groove to hold the slat.

4,499,893

SOLAR HEAT RECEIVER

Arlon J. Hunt, Oakland; Leif J. Hansen, Berkeley, and David B. Evans, Orinda, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 426,370

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—449 **16 Claims**

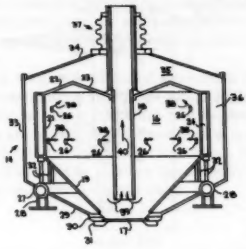
1. A receiver for heating a gas by solar energy which minimizes impingement of radiation on the walls of the receiver and provides maximum heating at and near the entry of a passageway into which a gas to be heated passes, said receiver comprising:

a housing constructed to allow for expansion and defining a chamber therein, said housing having a lower section in

the shape of an inverted frusto-conical surface having an opening therein, a generally cylindrical wall section, and a roof section composed of frusto-conical members;

a gas manifold postitioned around at least said cylindrical wall section of said housing;

means for directing gas to be heated from said manifold into said cylindrical wall section of said housing defining said chamber in a cyclone fashion;



a gas exhaust means positioned in said housing and having a gas entry located in said lower section of said housing and in open communication with said chamber; and

window means positioned in said lower section of said housing for admitting solar energy thereinto and at least onto said gas entry of said gas exhaust means;

whereby maximum heating is at and near said gas entry.

4,499,894

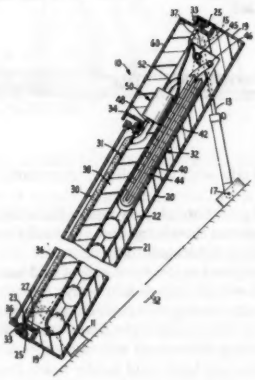
PASSIVE SOLAR WATER HEATER SUPPORT BOX

Bruce S. Buckley, 7067 Via Blanca, San Jose, Calif. 95139, assignor to B. Shawn Buckley, San Jose, Calif.

Filed Aug. 9, 1982, Ser. No. 406,504

Int. Cl.³ F24J 3/00

U.S. Cl. 126—450 **17 Claims**



1. A method of forming a solar water heating tank support box of a single sheet of plastic material which

comprises securing each of the edges of said plastic sheet to an open rectangular reinforcing bar member to form therewith the integral upper edges of said box,

extending the surface of said plastic sheet continuously and transversely from each of the inner edges from of said bar member to form side wall surfaces and laterally between the other ends of said side wall surfaces to form a unitary side wall and bottom surface of an open top box, and

insulating the interior surface of said plastic sheet forming said open top box to assure that the tensile strength of said plastic sheet is not exceeded by the weight of heated liquid in a tank supported by said unitary bottom and said side wall surfaces and that the compressive forces of said weight are thereby transferred to said reinforcing bar member whereby said box may be tilted to a desired angle at a plurality of support points around the periphery of said reinforcing bar member.

4,499,895

ENDOSCOPE SYSTEM WITH AN ELECTRIC BENDING MECHANISM

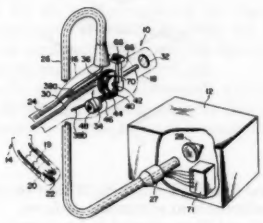
Syuichi Takayama, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1982, Ser. No. 434,233

Claims priority, application Japan, Oct. 15, 1981, 56-164678; Oct. 20, 1981, 56-167594; Nov. 2, 1981, 56-176236

Int. Cl.³ A61B 1/06

U.S. Cl. 128—6 **11 Claims**



1. An endoscope apparatus comprising:

(a) an insertion section bendable in a body cavity upon insertion thereinto;

(b) an endoscope body mechanically coupled to said insertion section;

(c) motor means in said endoscope body for generating rotating torque for bending said insertion section;

(d) an operation lever member provided in and protruding at least partially from said endoscope body so as to be manually operable by an operator;

(e) bending mechanism means in said insertion section and said endoscope body and coupled to said motor means, to said insertion section and to said operation lever member, for bending said insertion section and rotating said operation lever member by the torque from said motor means;

(f) lever operating amount detecting means mounted to said operation lever member, for changing the resistance value thereof in response to elastic deformation in said lever member when an operator operates said lever member and external pressure is applied and, for detecting an operating amount of said lever member; and

(g) control circuit means, electrically connected to said motor means and said lever operating amount detecting means, for supplying electricity to said motor means in response to changes in the resistance of said operation lever member, thereby causing said bending mechanism means to bend said insertion section and to rotate the lever member in substantially the same direction as the direction of lever operation to decrease the elastic deformation of said operation lever member and, for shutting off said motor means when the change in resistance of said lever operating amount detecting means reaches substantially zero in response to the elastic deformation of said lever member reaching substantially zero, to thereby control the bending of said insertion section such that the bending is automatically stopped when the insertion section is bent by an amount corresponding to said lever operation amount; said control circuit means including switching transistor means electrically connected to said lever operating amount detecting means, for controlling the power supply to said motor means, in response to a change in the

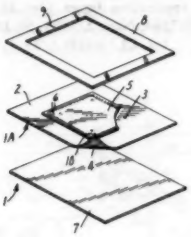
resistance value of said lever operating amount detecting means, in such a manner that said motor means is rotated forward or backward in response to the change in the resistance value of said lever operating amount detecting means.

4,499,896

RESERVOIR WOUND DRESSING

Steven B. Heinecke, New Richmond, Wis., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Mar. 30, 1982, Ser. No. 363,609
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—156 **10 Claims**



1. A wound dressing comprising at least two films, each of which is conformable to anatomical surfaces,

the first of said films adapted to be placed over a wound surface having a moisture vapor permeability of at least 300 grams per square meter per 24 hours at an 80 percent relative humidity differential at 40° C., being impermeable to liquid water throughout substantially its entire imperforate area, and containing at least one perforation therein positioned for passing wound exudate therethrough; said first film having a pressure sensitive adhesive on the wound contacting surface thereof for attaching said dressing to anatomical surfaces;

the second of said films being imperforate, impermeable to liquid water, and having a moisture vapor permeability of at least 600 grams per square meter per 24 hours at an 80 percent relative humidity differential at 40° C., said second film overlying said first film and being attached at its periphery to said first film on the side opposite to that having said pressure-sensitive adhesive thereon, and extending over an area surrounding said at least one perforation;

said dressing providing a reservoir between said first and second films into which excess exudate can pass and be evaporated to the ambient environment.

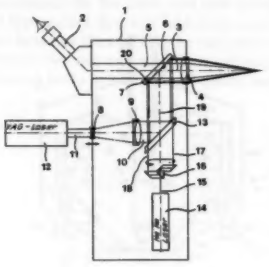
4,499,897

OPTICAL HEAD OF AN INSTALLATION FOR OBSERVATION AND TREATMENT OF THE EYE BY LASER RADIATION

Philippe Rousset, NL-Wassenaar, Netherlands, assignor to Lasag AG, Switzerland

Filed Mar. 7, 1983, Ser. No. 472,934
Claims priority, application Switzerland, Mar. 11, 1982, 1495/82
Int. Cl.³ A61B *17/36;* A61N *3/00;* G02B *27/14*
U.S. Cl. 128—303.1 **9 Claims**

1. The optical head of an installation for observation and treatment by a laser beam of an eye, comprising observing means for observing the zone of the eye to be treated, means for producing a treatment laser radiation beam, means for producing a marking laser radiation beam forming a visible envelope of the treatment beam, a focusing lens, the axis of which is coincident with the optical axis of the observing means for focusing the treatment and the marking beams on the zone of the eye to be treated, and a first mirror disposed on said treatment and marking beams between said observing means and said focusing lens for reflecting said treatment and marking beams towards said focusing lens, said first mirror having an outer portion intersecting only said marking beam, the reflection coefficient of said outer portion being maximum for the wavelength of said marking beam and an inner portion intersecting only said treatment beam, the reflection coefficient of



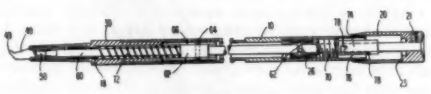
said inner portion being maximum for the wavelength of said treatment beam and minimum for the wavelength of said marking beam, whereby said treatment beam is prevented from reaching said observing means after reflecting on the zone of the eye to be treated and said marking beam is able to reach said observing means after reflection on the zone of the eye to be treated.

4,499,898

SURGICAL KNIFE WITH CONTROLLABLY EXTENDABLE BLADE AND GAUGE THEREFOR

William R. Knepshield; David D. Ogletree, both of Malvern, and Nat Sander, Broomall, all of Pa., assignors to KOI Associates, Frazer, Pa.

Filed Aug. 23, 1982, Ser. No. 410,476
Int. Cl.³ A61B *17/32;* B26B *1/08*
U.S. Cl. 128—305 **16 Claims**



1. Surgical knife with controllably extendable blade comprising:

(a) a generally cylindrical body with a front end, a rear end, axially displaced therefrom, and a centrally disposed axial opening along the length thereof;

(b) a blade disposed at the front end of said body in a plane which includes the axis of said body;

(c) a blade holder having said knife blade secured at the front end thereof, said holder extending rearwardly from said front end along the axis of said body to a distal end disposed within said body, said holder being freely movable along said axis, said holder further including, at its distal end, a cam surface perpendicular to said axis;

(d) a foot, having a frontal surface fixed with respect to said body, and a central axial opening being aligned and in communication with said central axial opening of said body;

(e) means for restraining said holder from angular movement about said axis;

(f) means for urging said holder rearwardly along said axis;

(g) a generally cylindrical adjustment knob, a section of which overlaps a section of said body and is rotatable thereabout and slidable therealong

(h) a cam member having a front cam projection in contact

with said distal end cam surface of said blade holder, said cam member extending rearwardly thereof along said axis and being urged rearwardly by said urging means while permitting relative rotational movement between said cam projection and said cam surface;

(i) means for fastening said cam member to said knob;

(j) holder positioning means threadedly secured within said body for longitudinal adjustment of said holder positioning means relative to said body along said axis by rotational adjustment of said positioning means; and

(k) selective means for permitting limited axial movement of said holder, cam member and knob relative to said holder positioning means at either one of two fixed axially spaced positions;

(l) means for coupling rotational movement of said knob to cause corresponding rotational movement of said holder positioning means so that when said holder, cam member and knob are at one of said fixed axially spaced positions, relative to said holder positioning means, the longitudinal position of said blade, relative to said body, is adjusted by rotational movement of said knob.

4,499,899

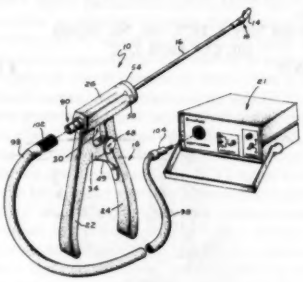
FIBER-OPTIC ILLUMINATED MICROSURGICAL SCISSORS

William G. Lyons, III, Wilbraham, Mass., assignor to Brimfield Precision, Inc., Brimfield, Mass.

Continuation-in-part of Ser. No. 459,949, Jan. 21, 1983,. This application Jun. 30, 1983, Ser. No. 509,780

Int. Cl.³ A61B *17/32*

U.S. Cl. 128—305 **4 Claims**



3. A rotary cutting scissors for surgery, said scissors comprising:

(a) a pair of scissor blades mounted on an end of a shaft assembly for snipping away tissue during the surgery;

(b) said shaft assembly having an outer tube and a concentric inner rod telescopically mounted for rotation therein while remaining axially stationary relative to the outer tube, wherein one of the scissor blades is mounted in a fixed, angularly offset position on an end of the inner rod while the other blade is fixedly mounted in an opposed, angularly offset position on an adjacent end of the outer tube;

(c) said shaft assembly and said outer tube and said inner rod each having an opposite end mounted within a longitudinally-extending bore of a spring-loaded rongeur handle that is adapted to be grasped by the cupped hand of a user, said handle having a rear body with an upper portion that contains the bore and the front trigger pivotally attached to the rear body, wherein the trigger has a finger that extends through a longitudinally-extending slot in the upper portion and into the bore where the finger moves relative to the bore as the trigger is squeezed and released by the user;

(d) wherein said outer tube is fixed relative to the handle;

(e) a helical drive means housed in the bore of the rear body to rotate the inner rod relative to the outer tube and cause the scissor blade attached to the inner rod to rotate against the other scissor blade attached to the fixed outer tube, while the inner rod and outer tube remain substantially axially stationary relative to each other, so that a cutting surface on one of the blades mates with a complementary cutting surface on the other blade to produce a snipping action, said drive means including a gear fixedly attached to the inner rod wherein the gear includes a helical groove on its periphery that engages the finger of the trigger so that the groove cooperates with the finger, as the trigger is being squeezed and released, and the finger moves in the slot to rotate the inner rod and thereby rotate its attached scissor blade relative to the scissor blade of the outer tube, and wherein the entire the drive means housed is said bore, except for the finger, remains axially stationary relative to the members while the blades are being rotated;

(f) means for emitting a fiber-optic light near the scissor blades during surgery to brightly illuminate the line of cut produced by the blades, wherein the lighting means moves in tandem with the longitudinal axis of the shaft assembly to constantly illuminate the line of cut during shifting of the axis in the surgery; and,

(g) wherein the inner rod is hollow with a central through bore and the lighting means comprises a fiber-optic bundle that substantially fills the bore and is secured to both ends of it.

4,499,900

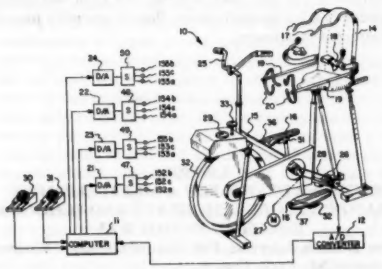
SYSTEM AND METHOD FOR TREATING PARALYZED PERSONS

Jerrold S. Petrofsky, Beavercreek; Chandler A. Phillips, Tipp City; Roger M. Glaser, Dayton, and Harry H. Heaton, III, Beavercreek, all of Ohio, assignors to Wright State University, Dayton, Ohio

Filed Nov. 26, 1982, Ser. No. 444,647

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—423 W **35 Claims**



1. A treatment system for a paralyzed person comprising:

a pair of oppositely disposed pedals mounted for rotation about an axis,

load means responsive to rotation of said pedals for generating a rotation resisting torque,

sensing means for sensing the position of said pedals,

computing means responsive to said sensing means for generating first, second, third and fourth control signals,

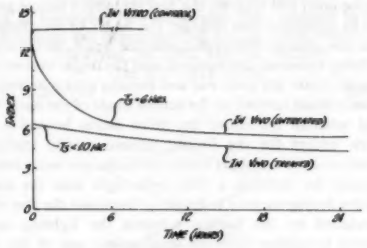
stimulation means responsive to said first, second, third and fourth control signals for cooperatively stimulating the right quadriceps, left quadriceps, right iliac and left iliac muscles respectively of said person to cause rotation of said pedals against said resisting torque, and

amplitude control means connected to said computing means for adjusting the amplitude of said control signals.

4,499,901
RETREATED SENSING ELECTRODE

Joseph J. Chang, and Maynard Ramsey, III, both of Tampa, Fla., assignors to Critikon, Inc., Tampa, Fla.

Filed Jun. 30, 1983, Ser. No. 509,500
Int. Cl.³ G01N 27/30
U.S. Cl. 128—635 15 Claims



1. In an electrode assembly for insertion into a living animal to continuously monitor blood gas concentration, which assembly includes an electrode and a hydrophilic polymer membrane covering said electrode, wherein said membrane is hydrophilic substantially throughout its thickness, the improvement which comprises:

said covering membrane being pretreated by having applied thereto a liquid solution comprising blood derived albumin, said pretreated membrane than being sterilized; and

said electrode assembly exhibiting a lower T_S than an assembly having an untreated membrane.

10. A method for decreasing the T_S of an electrode assembly for insertion in a living animal to continuously monitor blood gas concentration, which assembly includes an electrode and a hydrophilic polymer membrane covering said electrode, wherein said membrane is hydrophilic substantially throughout its thickness, comprising the steps:

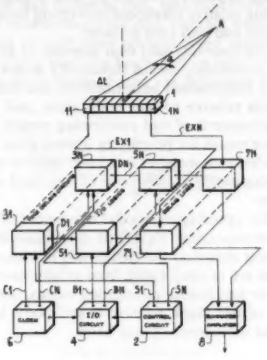
pretreating said electrode by applying to said membrane a liquid solution comprising blood derived albumin and then sterilizing said electrode, whereby the T_S of said electrode assembly is substantially lower than an assembly having an untreated membrane.

4,499,902
RECEIVER DEVICE FOR A MULTI-ELEMENT ULTRASONIC PROBE ECHOGRAPH AND ECHOGRAPH EQUIPPED IN THIS WAY

Dietmar Demuth, Schwerte, Fed. Rep. of Germany, assignor to Thomson-CSF, Paris, France

PCT No. PCT/FR81/00082, § 371 Date Feb. 22, 1982, § 102(e) Date Feb. 22, 1982, PCT Pub. No. WO82/00061, PCT Pub. Date Jan. 7, 1982
PCT Filed Jun. 23, 1981, Ser. No. 355,576
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1980, 3023386
Int. Cl.³ A61B 10/00
U.S. Cl. 128—660 3 Claims

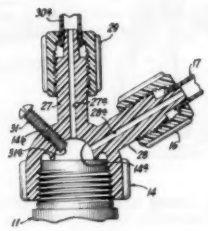
1. A receiver device for a multielement ultrasonic probe echograph comprising a probe having a plurality of transducer elements (11, 1N), a corresponding number of CCD units (71, 7N) respectively interconnected between the transducer elements and a summator means (8), one clock means (9) and, for each CCD unit, a delay time counter means (111) connected between said clock means and a respective gate means connected to a control input of said CCD unit and furthermore a corresponding line length counter (131) downstream of said gate means, outputs of all said line length counters being connected to validation means of read control means (4) of the CCD devices previously operated in record mode.



4,499,903
METHODS AND APPARATUS FOR TESTING A BLOOD PRESSURE MONITORING SYSTEM OF THE HYDRAULIC TYPE

Emanuel F. Furst; Louis F. Lampe, and William L. Woods, all of Tucson, Ariz., assignors to University of Arizona Foundation, Tucson, Ariz.

Filed May 3, 1979, Ser. No. 35,609
Int. Cl.³ A61B 5/02
U.S. Cl. 128—675 8 Claims



1. Apparatus for monitoring a blood pressure of a patient comprising:

a pressure transducer having a pressure sensitive element;

means for containing hydraulic liquid disposed in fluid communication with said pressure sensitive element of said transducer and disposed between said pressure sensitive element and a catheter means;

hydraulic liquid filling said containing means for transmitting blood pressure variations of the patient to the pressure sensitive element of said transducer;

catheter means establishing fluid communication between a circulatory system of said patient and said hydraulic liquid;

a solid member disposed in communication with said hydraulic liquid, insertable into said containing means and capable of being withdrawn from said containing means in a predetermined amount to cause a predetermined volumetric change in said hydraulic liquid containing means thereby to change the pressure exerted by said hydraulic liquid on said pressure sensitive element of said transducer; and

means for sensing changes in pressure on said pressure sensitive element.

4,499,904

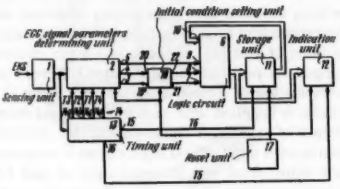
HEART MONITORING DEVICE

Georgy I. Sidorenko; Georgy P. Lopato; Vladimir M. Yakubovich; Yaroslav G. Nikitin; Oleg I. Usachev, and Anatoly P. Vorobiev, all of Minsk, U.S.S.R., assignors to Belorussky Nauchnoissledovatelsky Institut Kardiologii, Minsk, U.S.S.R.

Filed Feb. 23, 1983, Ser. No. 469,036

Int. Cl.[3] A61B 5/04

U.S. Cl. 128—703 5 Claims



1. A heart monitoring device for monitoring the heart activity of a person by using an ECG (electrocardiograph) signal comprising:

a sensing unit for detecting R-waves of said ECG signal characterizing the heart activity of the person, said sensing unit having an input supplied with said ECG signal, and an output;

an ECG signal parameters determining unit responsive to variation in relation between the durations of intervals between the R-waves of said ECG signal and having a data input connected to said output of said sensing unit, a plurality of control inputs, a reset input, a first output, a second output, and a third output, said ECG signal parameters determining unit being arranged to produce at said first output a first signal when the magnitude of the difference between the duration of the last occurring interval between the R-waves of said ECG signal and the duration of the interval between the R-waves immediately preceding the last occurring interval is smaller than a first predetermined percentage of the duration of the last occurring interval, and to produce at said first output a second signal when the magnitude of the difference between the last occurring interval between the R-waves of said ECG signal and the duration of the interval between the R-waves immediately preceding the last occurring interval is greater than, or equal to, said first predetermined percentage of the last occurring interval, said ECG signal parameters determining unit being arranged to produce at said second output a first signal when the duration of the last occurring interval between the R-waves of said ECG signal is smaller than the duration of the interval between the R-waves immediately preceding the last occurring interval, and to produce at said second output a second signal when the duration of the last occurring interval between the R-waves of said ECG signal is greater than, or equal to, the duration of the interval between the R-waves immediately preceding the last occurring interval, said ECG signal parameters determining unit being arranged to produce at said third output a first signal when the difference between the duration of the last occurring interval between the R-waves of said ECG signal and the duration of the interval between the R-waves immediately preceding the interval which immediately preceeds the last occurring interval is smaller than a second predetermined value, and to produce at said third output a second signal when the difference between the duration of the last occurring interval between the R-waves of said ECG signal and the duration of the interval between the R-waves immediately preceding the interval which immediately preceeds the last occurring interval is greater than, or equal to, said second predetermined value;

a logic circuit having a plurality of inputs and a plurality of outputs, a first input of said plurality of inputs being connected to said first output of said ECG signal parameters determining unit, a second input of said plurality of inputs being connected to said second output of said ECG signal parameters determining unit, and a third input of said plurality of inputs being connected to said third output of said ECG signal parameters determining unit;

a storage unit having a plurality of inputs respectively connected to corresponding outputs of said plurality of outputs of said logic circuit, a control input, a reset input, and a plurality of outputs respectively connected to corresponding remaining inputs of said plurality of inputs of said logic circuit;

an indication unit having a plurality of data inputs respectively connected to corresponding outputs of said plurality of outputs of said logic circuit, a reset input, and a control input;

a timing unit having an input connected to said output of said sensing unit, a first output connected to said control input of said storage unit, a second output connected to said control input of said indication unit, and a plurality of outputs respectively connected to corresponding control inputs of said ECG signal parameters determining unit, to supply said control inputs of said ECG signal parameters determining unit, said storage unit and said indication unit with signals during each interval between the R-waves of said ECG signal; and

a reset unit having an output connected to said reset inputs of said ECG signal parameters determining unit, said indication unit and said storage unit;

said logic circuit being arranged to produce at said outputs thereof a first, second, third, fourth, fifth, sixth, seventh or eighth combination of signals, said logic circuit being arranged to produce at said outputs thereof said first combination of signals when said first input of said logic circuit is supplied with said second signal from said first output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said first signal from said second output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said first, third or eighth combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said first combination of signals when said first input of said logic circuit is supplied with said first signal from said first output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said first, third or eighth combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said second combination of signals when said first input of said logic circuit is supplied with said second signal from said first output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said second signal from said second output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said first, third or eighth combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said third combination of signals when said first input of said logic circuit is supplied with said second signal from said first output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said first signal from said second output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said seventh combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said fourth combination of signals when said first input of said logic circuit is supplied with said second signal from said first

output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said second signal from said second output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said seventh combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said fourth combination of signals when said first input of said logic circuit is supplied with said second signal from said first output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said second signal from said second output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said sixth combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said fifth combination of signals when said first input of said logic circuit is supplied with said second signal from said first output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said second signal from said second output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said fourth or fifth combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said fifth combination of signals when said first input of said logic circuit is supplied with said first signal from said first output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said fourth or fifth combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said sixth combination of signals when said first input of said logic circuit is supplied with said second signal from said first output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said first signal from said second output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said fourth or fifth combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said seventh combination of signals when said first input of said logic circuit is supplied with said second signal from said first output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said second signal from said second output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said second combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said seventh combination of signals when said first input of said logic circuit is supplied with said first signal from said first output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said second combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said seventh combination of signals when said first input of said logic circuit is supplied with said second signal from said first output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said first signal from said second output of said ECG signal parameters determining unit, said third input of said logic circuit is supplied with said second signal from said third output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said second combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said seventh combination of signals when said first input of said logic circuit is supplied with said first signal from said first output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said seventh combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said seventh combination of signals when said first input of said logic circuit is supplied with said second signal from said first output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said first signal from said second output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said sixth combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said seventh combination of signals when said first input of said logic circuit is supplied with said first signal from said first output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said sixth combination of signals at said outputs of said logic circuit, said logic circuit being arranged to produce at said outputs thereof said eighth combination of signals when said first input of said logic circuit is supplied with said second signal from said first output of said ECG signal parameters determining unit, said second input of said logic circuit is supplied with said first signal from said second output of said ECG signal parameters determining unit, said third input of said logic circuit is supplied with said first signal from said third output of said ECG signal parameters determining unit and said storage unit is stored with a code corresponding to said second combination of signals at said outputs of said logic circuit; and

said indication unit being arranged to indicate a grouped extrasystole when said logic circuit produces at said outputs thereof said first combination of signals, to indicate a single extrasystole when said logic circuit produces at said outputs thereof said third combination of signals, to indicate a block when said logic circuit produces at said outputs thereof said fourth combination of signals, to indicate a dangerous block when said logic circuit produces at said outputs thereof said fifth combination of signals, to indicate a bigeminal extrasystole when said logic circuit produces at said outputs thereof said eighth combination of signals, and to indicate a normal cardiac rhythm when said logic circuit produces at said outputs thereof said seventh combination of signals.

4,499,905

APPARATUS FOR MEASURING HUMAN RESPIRATION

Mishel Greenberg, New Hyde Park, N.Y.; William H. Smyers, Jr., Wethersfield, Conn., and Milton Chernack, New York, N.Y., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed May 5, 1982, Ser. No. 375,298
Int. Cl.³ A61B 5/08
U.S. Cl. 128—727 **20 Claims**

1. An inhalation device for use in inhalation of air into human lungs comprising:

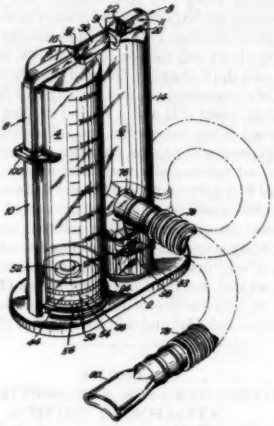
(a) a first hollow cylindrical chamber for slidably receiving a piston, the chamber being vented to the atmosphere;

(b) a movable piston assembly slidably mounted within said first cylindrical chamber;

(c) at least a second hollow chamber sealed from fluid communication with the first chamber, said second chamber communicating with the atmosphere;

(d) sealing means assembly for preventing fluid communication between said first and second chambers, said sealing means assembly including a first opening means communicating with said first chamber and a second opening means communicating with said second chamber;

(e) a breathing tube assembly connected in cooperative relationship to said sealing means assembly and in fluid



communication with said first and second chambers through said first and second opening means.

4,499,906

PERCUSSION INSTRUMENT

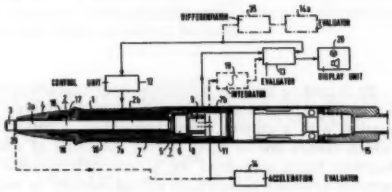
Jüergen Wohlgemuth, Darmstadt, and Eugen Hohmann, Bensheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,881

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1982, 3215530

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—776 **18 Claims**



1. A percussion instrument comprising:

a housing;

a ram displacably seated in said housing consisting of at least a section of non-magnetic material and a section of low magnetic retentive material;

a drive means for accelerating said ram from an initial position to free flight at a constant velocity toward an object to be tested by the reactive rebound of said ram there against and for returning said ram to said initial position, said drive means including at least one drive coil surrounding a portion of said ram and into which said low magnetic retentive section of said ram extends up to approximately one-half of the length of said coil when said ram is in said initial position;

a control means connected through a switch to said drive means for supplying periodic current pulses to said drive coil; and

an evaluator means including a measuring means for measuring the velocity of said ram, a comparator for comparing the actual value of said ram with a rated velocity value, and a switch control means for interrupting the connection between said drive means and said control means when said actual velocity equals said rated velocity during acceleration of said ram.

4,499,907

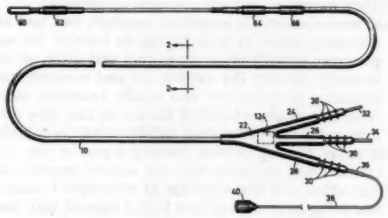
ENERGY LIMITING CARDIOVERSION LEAD

Michael J. Kallok, New Brighton, and Gene A. Bornzin, Coon Rapids, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 15, 1982, Ser. No. 441,887

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—786 **12 Claims**



1. A transvenous cardioversion lead for implant in the human heart, comprising:

an elongated insulative lead body;

a first conductor, having a proximal end and a distal end, mounted within said lead body;

a second conductor, having a proximal and a distal end, mounted within said lead body, insulated from said first conductor;

a first connector, coupled to the proximal end of said first conductor;

a second connector, coupled to the proximal end of said second conductor;

a first electrode, exposed to the exterior of said lead body and coupled to the distal end of said first conductor, for applying electrical energy to heart tissue;

a second electrode, exposed to the exterior of said lead body and coupled to the distal end of said second conductor, for applying electrical energy to heart tissue; and

energy-reducing means coupled to said first and second conductors for reducing the electrical energy of a cardioversion pulse applied to said first and second connectors from a first energy as applied to said first and second connectors to a reduced second energy as applied to said heart tissue by said first and second electrodes.

4,499,908

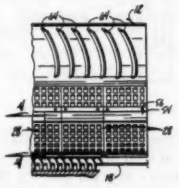
COMBINE CONCAVE STRUCTURE

Frederick D. Niehaus, Rte. 1, Martelle, Iowa 52305

Continuation of Ser. No. 364,502, Apr. 1, 1982,. This application Feb. 7, 1984, Ser. No. 577,866

Int. Cl.³ A01F *12/26, 12/28*

U.S. Cl. 130—27 K **1 Claim**



1. An improvement in a combine having a combine frame, a rotor mounted to said frame for rotation about a horizontal

axis, said rotor having an outer radial surface, a cylindrical housing assembly surrounding and enclosing said cylindrical surface of said rotor, said housing assembly comprising an upper housing portion and a concave portion connected to said upper housing portion and forming a lower cylindrical wall for said housing assembly; said concave portion having first and second opposite lateral edges, said first lateral edge being hinged to said frame for hinged movement about a hinge axis running parallel to said horizontal axis of said rotor, said second lateral edge being adjustably attached to said upper housing to permit selective adjustment of the concave portion about said hinge axis so as to move said concave toward and away from said rotor; said concave comprising a grid work mesh formed by a plurality of spaced apart axially extending members and a plurality of spaced apart circumferentially extending members; said improvement comprising:

said circumferentially extending members and said axially extending members each having an interior flat surface presented radially inwardly toward said rotor, all of said inwardly interior flat surfaces of said circumferentially extending members and said axially extending members lying in a single cylindrical surface so that they are free from projections extending radially inwardly therefrom;

said upper housing portion forming a part of the circular cylinder and including first and second opposite lateral side edges, said first side edge of said upper housing portion being adjacent said first lateral edge of said concave portion, a rectangular cover plate having a first elongated edge attached to said upper housing along a line extending parallel to and being spaced above said first side edge of said upper housing portion, said cover plate having a second elongated edge which engages the interior surface of said concave portion along a line adjacent and spaced below said first edge of said concave portion, whereby said cover plate spans and covers the junction between said first edge of said upper housing portion and said first edge of said concave portion.

4,499,909

CIGARETTE MANUFACTURING MACHINE

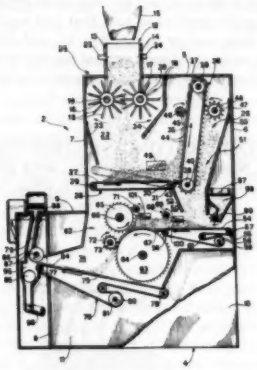
Enzo Seragnoli, Bologna, Italy, assignor to G.D Societa' per Azioni, Bologna, Italy

Filed Mar. 12, 1981, Ser. No. 243,137

Claims priority, application Italy, Apr. 8, 1980, 48353 A/80

Int. Cl.³ A24C *5/18*

U.S. Cl. 131—84 R **10 Claims**



1. A cigarette manufacturing machine of the continuous rod type comprising at least one manufacturing unit (1) which itself comprises a suction conveyor (88) for the formation of a continuous tobacco filler, the tobacco being fed to said suction conveyor (88) by means of a distributor (2), characterized in that said distributor (2) comprises, in combination, a first chamber (22), an inlet duct (12) connected to said first chamber (22), a second chamber (50), a feed channel (51) connecting said first chamber (22) and second chamber (50) together, a feed unit (26) extending along said feed channel (51), a third chamber (74), a carding unit (62) disposed between said second chamber (50) and third chamber (74), and an ascending outlet duct (79) closed upperly by said suction conveyor (88) and communicating with said third chamber (74) and with feed means (85) for a stream of compressed air, said carding unit (62) comprising a first carding roller (63) and a second carding roller (65), the first disposed below the second and substantially tangential to each other, and said second chamber (50) comprising a base wall disposed substantially tangential to an upper generating line of said first carding roller (63) and defined, at least partly, by a belt (54) constituted by the upper run of a conveyor belt (55) movable towards said carding unit (62); control means (49, 100–101) being provided for controlling the tobacco level in at least one of said first chamber (22) and second chamber (50), and first, second and third operating means (41, 60, 82) being mounted on said distributor for operating said feed unit (26), said conveyor belt (55) and said carding unit (62) respectively.

4,499,910

CUTTING HEAD FOR A CIGARETTE FILTER ATTACHMENT MACHINE

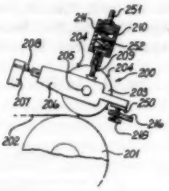
Derek H. Dyett; Godfrey A. Wood, both of High Wycombe, England, and Albert D. Seim, II, Richmond, Va., assignors to Molins, Ltd., London, England

Filed Nov. 23, 1981, Ser. No. 324,031

Claims priority, application United Kingdom, Nov. 21, 1980, 8037441

Int. Cl.³ A24C *5/56*

U.S. Cl. 131—95 **20 Claims**



20. A cutting head for a cigarette filter attachment machine, for cutting a filter attachment web at regular intervals in cooperation with a cutting drum, comprising a rotary member which carries one or more knives, each end of said rotary member being supported by a separately-movable carrier member pivotally mounted on a fixed member by means of a leaf spring, means for urging the rotary member towards the cutting drum with a predetermined force, and a damping member for each carrier member arranged to resist movement of the rotary member towards the cutting drum at least along part of the range of such movement.

4,499,911

ENERGY EFFICIENT CURING AND DRYING SYSTEM

William H. Johnson, 4000 Brothwell Ct., Raleigh, N.C. 27606

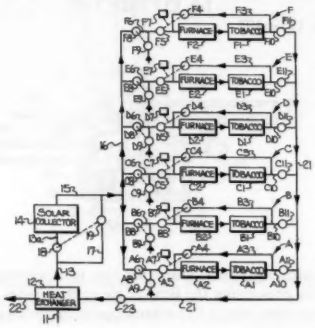
Filed Dec. 9, 1980, Ser. No. 214,772

Int. Cl.³ A24B *3/10, 3/12*

U.S. Cl. 131—302 **30 Claims**

10. In a method for curing tobacco in which air, under controlled conditions of temperature and humidity, is directed in a recirculating flow path through a batch of tobacco leaves disposed in a curing chamber, with the air being heated as necessary by a furnace, and with the humidity conditions in the curing chamber being controlled by selectively admitting fresh air to the recirculating flow of air through the curing chamber while discharging exhaust air, said curing method following an established curing schedule in which the tobacco first under-

goes a yellowing phase wherein the air is maintained at a temperature of about 95°–105° F. with high air recirculation and relative humidity to promote yellowing of the tobacco leaves, the tobacco thereafter undergoing a drying phase in which the relative humidity is reduced by admitting fresh air and discharging humid exhaust air and while gradually increasing the temperature of the air to about 165° F. to promote drying of the tobacco, the combination therewith of an improvement characterized by substantially reducing the fuel costs for curing the tobacco, said improvement comprising carrying out said curing method concurrently for a series of batches of tobacco in respective individual curing chambers, each being provided with its own furnace, while beginning the



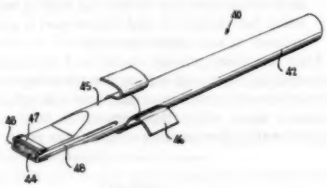
curing schedule for each respective batch in the series at a different time so that the batches of tobacco are at different phases of cure and at different conditions of temperature and humidity at any given time, with at least one batch being in the yellowing phase while at least one other batch is in the drying phase, collecting and combining the flows of heated exhaust air discharged from the respective curing chambers and directing the combined flows through a heat exchanger while also directing a stream of incoming fresh air through the heat exchanger for being preheated by the heat of the exhaust air, and supplying the thus preheated stream of fresh air to at least one of the respective curing chambers to thereby reduce the fuel requirements of the individual furnaces.

4,499,912

FREE AIR DILUTION SMOKE FILTER AND METHOD AND APPARATUS FOR FABRICATING SAME

Richard M. Berger, Midlothian, Va., assignor to American Filtrona Corporation, Richmond, Va.

Filed Dec. 23, 1981, Ser. No. 333,815
Int. Cl.³ A24D *3/04*
U.S. Cl. 131—336 **14 Claims**



1. A smoke filter comprising:

a smoker-pervious filter rod having a smoke receiving end and a smoke discharging end; and

smoke-impervious wrap means wrapped about and circumscribing said rod along its entire length;

wherein at least one groove is defined in said rod and said wrap means, said groove having a depth dimension extending radially inward of said rod and a length dimension which extends a predetermined distance along said rod from said smoke discharging end of said rod, said groove being open to ambient air along its entire length;

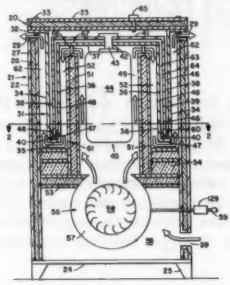
wherein said filter is contoured in the form of a cigarette holder with a raised lip in said smoke discharging end.

4,499,913

METHOD AND APPARATUS FOR PRODUCING FRICTION HEAT

Eugene J. Frenette, Derry, N.H., assignor to Albert Frenette, Derry, N.H.

Filed Mar. 20, 1980, Ser. No. 132,316
Int. Cl.³ F24C *9/00*
U.S. Cl. 126—247 **1 Claim**



1. Heat generating apparatus, comprising:

(a) a housing formed with an air inlet opening and an air outlet opening spaced from one another;

(b) a relatively fixed cylindrical casing mounted upright in said housing and formed with spaced cylindrical concentric inner and outer walls open at the upper end thereof, and closed at the lower end thereof to define at least one relatively deep annular well at the lower portion thereof for containing a quantity of lubricating liquid therein;

(c) a cylindrical rotor mounted in said casing for rotation about a vertical axis;

(d) said rotor being formed with a cylindrical tubular lower skirt extending concentrically into said well and defining a pair of relatively small annular inner and outer clearances with said inner and outer walls of said casing;

(e) said rotor including a transverse wall;

(f) power means drivingly connected to said transverse wall for rotating said rotor about said vertical axis whereby said liquid will move upwardly in both of said clearances and cause said walls to be heated; and

(g) air moving means operatively associated with said apparatus for flowing air against the outer surface of said walls between said inlet and outlet openings.

4,499,914

SELECTOR VALVE FOR AN AIRCRAFT ON BOARD OXYGEN GENERATION SYSTEM WITH HIGH PRESSURE OXYGEN BACKUP

Bernard J. Schebler, Davenport, Iowa, assignor to Litton Systems, Inc., Davenport, Iowa

Filed Apr. 14, 1983, Ser. No. 484,964
Int. Cl.³ A61M *15/00*
U.S. Cl. 137—81.1 **5 Claims**

1. A selector valve for controlling the flow of oxygen from a primary, or a secondary, backup source, singly or in combination, either selected manually or automatically to suit environmental condition, said selector valve comprising:

a three-position manual switch including a cam surface;

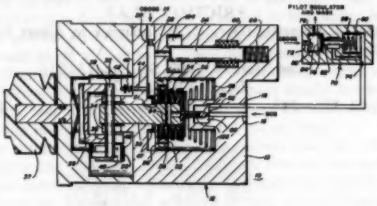
a slidable stem controlled by said cam surface;

a piston surface mounted on said stem and exposed on one

side to a control pressure derived from the primary source;

a poppet valve for controlling the flow of oxygen from the secondary source, said poppet valve being coupled to said stem;

control pressure vent means for venting said control pressure to atmosphere, whereby,



(1) in the first position of the switch the poppet valve is mechanically closed by said stem to prevent the flow of oxygen from the secondary source,

(2) in the second position said control pressure maintains the poppet valve mechanically closed, and

(3) in the third position said control pressure is vented to atmosphere, allowing the poppet valve to open to allow the flow of oxygen from the secondary source.

4,499,915

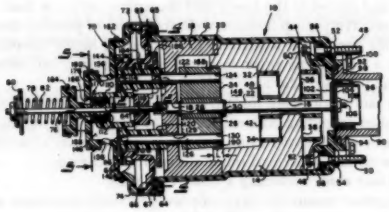
FLUID PRESSURE SIGNAL TRANSDUCER

Kirk B. Peloza, Wheaton, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 21, 1983, Ser. No. 544,164

Int. Cl.³ G05D *16/00*

U.S. Cl. 137—85 **13 Claims**



1. An electrically controlled fluid pressure modulator valve comprising:

(a) housing means defining a fluid pressure signal chamber having an inlet port for connection to a source of fluid pressure, an exhaust port and a signal output port;

(b) pressure responsive means operably sensing the pressure differential between said signal chamber and the atmosphere external to said housing means;

(c) valve means, operable upon movement to control fluid communication between said inlet port and said chamber and between said chamber and said exhaust port;

(d) magnetomotive force means including electromagnetic means defining opposite magnetic poles received on said housing means and adapted for connection to receive an electrical control signal;

(e) rotor means formed of ferromagnetic material received said housing means and defining an axial overlap and radial air gap with said poles, said rotor means rotatable with respect to said poles for effecting rotation of said valve means upon experiencing a torque applied by said magnetomotive force means, said rotor means being disposed for axial movement for varying said axial pole overlap; and,

(f) means connecting said pressure responsive means and said rotor means and operable to effect changes in said axial overlap in response to changes in said pressure differential.

4,499,916

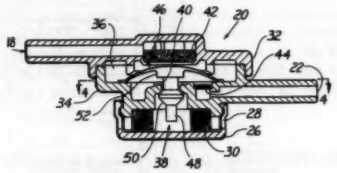
VACUUM CHECK VALVE

John D. Hanson, Mississauga, and John E. Cook, Chatham, both of Canada, assignors to Allied Corporation, Morristown, N.J.

Filed Jan. 31, 1983, Ser. No. 462,180

Int. Cl.³ F02P *5/10*

U.S. Cl. 137—103 **3 Claims**



1. A vacuum check valve for use in a vacuum operated system for preventing the flow of air contaminates and vapors from a vacuum source to vacuum operated devices, the check valve comprising:

a housing with a first and second chamber therein;

an orifice interconnecting said first and second chamber;

an input port connected to said first chamber and adapted to receive the vacuum source;

an output port from said first chamber and adapted to be connected to the vacuum operated devices, said output port spaced from said input port;

a reference pressure source input connected to said second chamber;

a unitary umbrella valve in said orifice having

an umbrella-shaped top surface overlying both said orifice and said output port,

an elongated stem axially aligned from the underside of said umbrella-shaped top surface and extending through said orifice and into said second chamber;

an orifice closing member positioned on said stem and spaced from said umbrella-shaped top surface and being operable when the vacuum at said output port is equal to or less than the vacuum at said input port for closing said orifice from said reference pressure source allowing the flow of air only from said output port to said input port, and

a circular member connected on the underside of said umbrella-shaped top surface for sealing said orifice only when the vacuum at said output port is greater than the vacuum at said input port; and

at least one bleed passage under said circular member and extending from said orifice for allowing the flow of air only between said output port and said reference pressure source input when the vacuum at said output port is greater than the vacuum at said input port.

4,499,917

VENTILATOR FOR COLDROOM WITH PRESSURE RESPONSIVE VALVES

Toshimichi Fujiya, No. 4-22, Kounandai 6-chome, Kounan-ku, Yokohama-shi, Kanagawa-ken, Japan

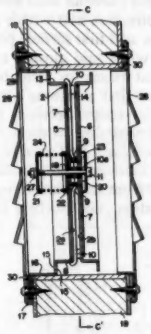
Filed Mar. 2, 1983, Ser. No. 471,257

Int. Cl.³ F16K *17/194*

U.S. Cl. 137—341 **7 Claims**

1. In a ventilator for a coldroom with pressure responsive valves wherein a first valve port and a second valve port are

formed independently from each other in a partition wall having supporting rib portions extending to cross a ventilation path, said first valve port is closed by a first valve plate disposed on the outer side of said partition wall, said second valve port is closed by a second valve plate disposed on the inner side of said partition wall, said first valve plate becomes free from said partition wall so as to open said first valve port when



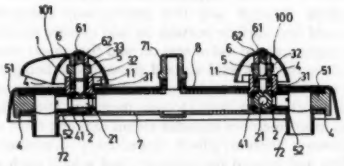
internal pressure is increased, and said second valve plate becomes free from said partition wall so as to open said second valve port when internal pressure is reduced, an improvement in that electric heaters are disposed at said supporting rib portions between said respective valve ports of said partition wall and at outer peripheral portions of said valve ports or in the vicinity of those portions, thereby to heat contact portions of said valve plates with said heated partition wall.

4,499,918

MIXING FAUCET

Jang T. Jong, 4th Fl./1, 47, Sec. 2, Shuang Shih Rd., Taichung, Taiwan

Filed Apr. 4, 1983, Ser. No. 482,134
Int. Cl.³ F16K *5/06, 19/00*
U.S. Cl. 137—606 **1 Claim**



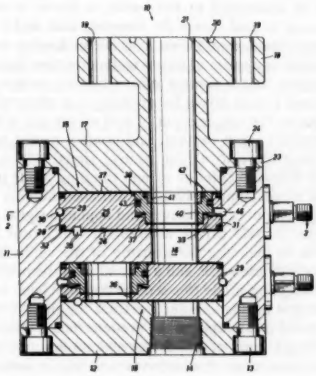
1. A globe mixing faucet comprising:
a water pipe;
a main body portion housing said water pipe, said main body portion being provided at the middle with a spigot communicating with said water pipe;
two globe valves provided in said water pipe, each of said globe valve comprising
a valve case formed on said water pipe and communicating therewith, said valve case being formed at the top with two protuberances set apart at an angle of 90°,
a globe plug disposed within said valve case, said globe plug having a groove thereon and a hole therethrough,
two wearing rings disposed at two sides of said globe plug respectively,
an adjusting collar threadedly engaged with said water pipe and capable of being turned in or out to adjust the engagement between said wearing rings and said globe plug,
a fixing screw threadedly engaged with said water pipe,
a sealing ring placed on said fixing screw for preventing leakage of water,
a transmission rod located in said casing, said transmission rod being provided at the lower end with a protuberance adapted to engage said groove of said globe plug,
two sealing rings surrounding said transmission rod,
a screw sleeve threadedly engaged with the top of said casing, said screw sleeve having a center hole through which the upper part of said transmission rod extends, and
a faucet handle threadedly engaged with the upper part of said transmission rod, said faucet handle having two projections which associate with said protuberances of said valve case to limit the movement of said faucet within 90°; and
two inlet pipes mounted at two sides of said water pipe.

4,499,919

VALVE

Buford G. Forester, #9 Cumberland Trail, Conroe, Tex. 77302

Division of Ser. No. 101,424, Dec. 10, 1979, Pat. No. 4,304,261.
This application Jul. 1, 1981, Ser. No. 279,430
Int. Cl.³ F16K *5/10;* **F16H** *1/04*
U.S. Cl. 137—613 **10 Claims**

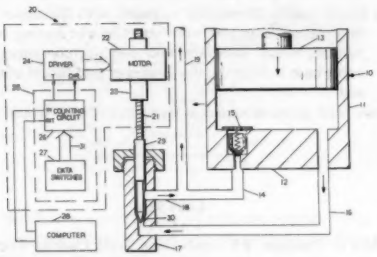


1. A rotary disk valve which comprises:
(a) a hollow valve body having a at least one cavity therein with a smooth planar wall;
(b) at least one flat circular valve disk supported in said cavity for rotary movement therein and in operative sealing engagement with said smooth planar wall, said flat valve disk having a pair of smooth parallel faces and having an opening therethrough asymmetrically positioned for rotation about the center of said disk;
(c) said valve body having an inlet and an outlet with a passage therebetween passing through said cavity interrupted by said flat valve disk;
(d) said valve disk being rotatable between a first position having the wall of said disk interrupting said passage and a second position having said disk opening aligned with said passage,
(e) a removable valve sleeve insert slidably positioned in said flat valve disk opening adapted to be removed therefrom; and
(f) spring means biasing said valve sleeve insert into operative sealing engagement with the smooth planar wall of said cavity, whereby said disk closes said passageway in said first position and opens said passageway in said second position.

4,499,920
APPARATUS FOR CONTROLLING A VALVE

Leonard D. Steffan, Perrysburg, Ohio, and Robert D. Kohler, Temperance, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 17, 1982, Ser. No. 378,563
Int. Cl.³ F15B *9/09*
U.S. Cl. 137—624.15 **1 Claim**



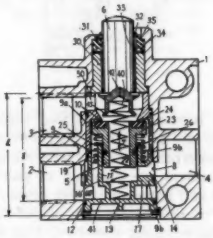
1. In apparatus for controlling the aperture size of a valve in a fluid exhaust line from a reciprocable fluid motor in an individual section of a glass forming machine wherein a stepper motor is connected to the valve, a driver is electronically connected to said motor for stepping said motor both clockwise and counterclockwise, said driver having a toggle input responsive to a series of pulses and a direction input responsive to a signal, and a control means having outputs electrically connected to said driver for applying a predetermined number of pulses to the toggle input of said driver and a first signal to the direction input thereof, said control means having a first input responsive to a first control signal which causes said control means to enter an extend toggling mode in which said control means applies the predetermined number of pulses to the toggle input of said driver and applies a signal to the direction input of said driver whereupon said motor steps in one direction to decrease the aperture of the valve from a preset size to a restricted size, and a second input responsive after the extend toggling mode to a second control signal which causes said control means to enter a retract toggling mode in which said control means applies the predetermined number of pulses to the toggle input of said driver and applies a second signal to the direction input of said driver whereupon said motor steps in the other direction to increase the aperture of the valve back to the preset size, the improvement in said control means comprising a first manual override switch for applying clock pulses directly to the toggle input of said driver and a second manual override switch which when open applies a high, valve opening signal to the direction input to said driver and when closed applies a low, valve closing signal to the direction input to said driver for adjusting the initial aperture size of said valve.

4,499,921
THREE-WAY AIR VALVE

Kurt Stoll, Lenzhalde 72, D-7300 Esslingen a.N., Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,646
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049110
Int. Cl.³ F16K *11/10*
U.S. Cl. 137—627.5 **10 Claims**

1. A valve, comprising a housing having means defining an elongate chamber therein and means defining first, second and third ports in said housing which are each in fluid communication with said chamber; sleevelike insert means which is disposed in said chamber and includes first and second axially offset insert members, said first insert member having means defining a valve seat thereon which faces generally in a first axial direction and having means for providing fluid communication between said first port and the region within said first insert member on the side of said valve seat remote from said second insert member; a closure member supported in said sleevelike insert means for axial movement between first and second positions, movement of said closure member from said first to said second position taking place in said first axial direction, said closure member having sealing surface means thereon which faces in a second axial direction generally opposite said first axial direction and which includes first and second surface portions, said first surface portion sealingly engaging said valve seat when said closure member is in said first position; first resilient means for yieldably urging said closure member toward said first position; a ram supported in said chamber for axial movement between third and fourth positions, movement of said ram from said third to said fourth position taking place in said first axial direction, said ram having a surface which faces generally in said first axial direction and which is spaced from said closure member when said ram is in said third position, said surface on said ram sealingly



engaging said second surface portion on said closure member when said ram has moved from said third position to a fifth position which is located between said third and fourth positions, movement of said ram from said fifth position to said fourth position effecting movement of said closure member from said first to said second position against the urging of said first resilient means; second resilient means for yieldably urging said ram toward said third position; and means defining first and second passageways which each provide fluid communication between opposite sides of said closure member, fluid flow through said first passageway being obstructed when said first surface portion on said closure member is sealingly engaging said valve seat on said first insert member, and fluid flow through said second passageway being obstructed when said surface on said ram is sealingly engaging said second surface portion on said closure member; and wherein said second insert member includes means defining third and fourth passageways therein which respectively communicate with said first and second passageways and which each communicate with a respective one of said second and third ports.

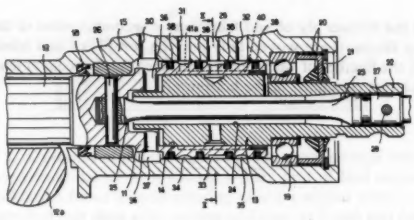
4,499,922
ROTARY DISTRIBUTOR FOR A HYDRAULIC SERVO-MECHANISM

Christian Tanguy, Frepillon, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Dec. 27, 1982, Ser. No. 453,015
Claims priority, application France, Jun. 1, 1982, 82 00090
Int. Cl.³ B26D *5/06*
U.S. Cl. 137—625.24 **7 Claims**

1. A rotary hydraulic distributor for a servo-mechanism, especially for the assisted steering system of a motor vehicle, of the type comprising two distributor elements provided with co-axial cylindrical portions, respectively an outer distributor element having a cylindrical inner surface and an inner distributor element having a cylindrical outer surface and rotatably mounted in an axial bore of said outer distributor element forming said inner surface and capable of a limited relative

rotation with respect to the latter, to and fro about a relative neutral position, wherein said distributor elements are provided with cavities which define a fluid circulation circuit connectable to a fluid source and a fluid reservoir and selectively to at least one chamber of an assistance cylinder, said fluid circulation circuit including variable restrictions defined by cooperating portions of said cavities opening in said inner and outer surfaces of said distributor elements, respectively, and variable as a result of a relative rotation between said distributor elements, characterized in that said cooperating portions of said cavities consist of:



an even number of evenly angularly spaced axially extending grooves closed at their axial ends formed in said inner surface of said outer distributor element, and

radially extending bores formed at regular angular intervals in said outer surface of said inner distributor element and positioned facing smooth inner areas of said inner surface of said outer distributor element between adjacent edges of two neighboring grooves thereof, when said distributor is in said neutral position.

4,499,923

CONCRETE PIPE WITH AN INNER LINING

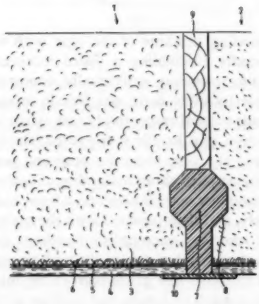
Heiner I. Hammer, Seevetal, Fed. Rep. of Germany, assignor to Schlegel Lining Technology GmbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 362,077, Mar. 26, 1982, abandoned. This application Mar. 22, 1984, Ser. No. 592,217

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3114003

Int. Cl.³ F46L *9/08*

U.S. Cl. 138—109 **13 Claims**



1. In a concrete pipe of the type including an elongated concrete wall having an inner surface and first and second ends, the improvement comprising; an inner lining sheet of flexible polymeric material disposed adjacent said inner surface, said sheet characterized by a first modulus of elasticity; a plurality of monofilamentary projections having one end attached to said lining sheet and the other end extending into said wall, said projections characterized by a modulus of elasticity greater than that of said sheet, and spaced apart a mean distance no greater than approximately three times the thickness of said sheet.

4,499,924

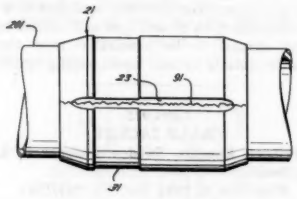
METHOD OF MAKING A DRILL PIPE WEAR SLEEVE ASSEMBLY AND PRODUCT THEREOF

William R. Garrett, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 197,057, Oct. 14, 1980, abandoned, which is a continuation of Ser. No. 010,235, Feb. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 818,672, Jul. 25, 1977, Pat. No. 4,146,060. This application Mar. 12, 1982, Ser. No. 357,783

Int. Cl.³ E21B *17/10;* **B26F** *3/00;* **B23K** *28/00;* **B23P** *17/00*

U.S. Cl. 138—110 **15 Claims**



1. Drill pipe comprising a tube, a tool joint at each end of the tube, a fractured sleeve welded together about the tube, said sleeve having an inner diameter smaller than the outer diameters of the tool joints, and adhesive cement between the sleeve and tube affixing the sleeve against axial and circumferential motion relative to the tube, said sleeve being fractured longitudinally at intervals not greater than one hundred and eighty degrees measured in both directions about the sleeve circumference.

5. Method of manufacturing belted drill pipe which drill pipe includes a tube and a wear belt about the tube in between the ends of the tube, said method comprising the steps of:

providing a tube and a wear belt, said belt including a circumferentially homogeneously integral metal sleeve,

forming a plurality of grooves in the sleeve extending from adjacent one end to adjacent the other end thereof, and not in excess of 180 degrees apart circumferentially,

cooling the entire sleeve to at least the ductile—brittle transition temperature,

extending the sleeve radially while at a temperature at least as low as said transition temperature to cause the sleeve to fracture along said grooves into a plurality of segments,

setting said segments with the fracture surfaces aligned and in engagement to reform the sleeve about said tube in the desired axial position therealong,

welding said segments together along said grooves, and

affixing said sleeve to said tube against both rotatinal and axial movement relative to said tube.

4,499,925

HOSE-LIKE SEAL DEVICE FOR CONCRETE JOINTS

Peter Kaufmann, Immensee, Switzerland, assignor to Aquarius für Dichte Bauten AG, Kirchberg, Switzerland

Continuation-in-part of Ser. No. 232,515, Feb. 9, 1981, abandoned. This application Nov. 18, 1982, Ser. No. 442,751

Claims priority, application Switzerland, Mar. 5, 1980, 1738/80

Int. Cl.³ F16L *11/12*

U.S. Cl. 138—125 **6 Claims**

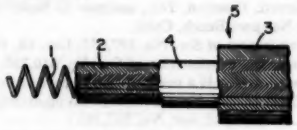
1. A hose-like sealing device for concrete joints, essentially consisting of:

an inner liquid pervious support body;

a first liquid pervious meshed hose member surrounding said support body;

a second liquid pervious meshed hose member surrounding said first hose member; and

sealant throughpassing means for passing a liquid sealing agent therethrough;



said sealant throughpassing means comprising a member formed of a paper-like structure arranged in a hose-like fashion between both of said first and second hose members and adapted to be penetrated from the interior towards the outside by said liquid sealing agent.

4,499,926

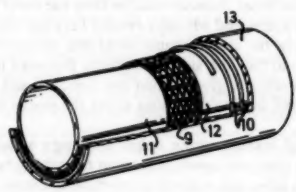
CABLE JACKET

Gunnar S. Friberg, Kungälv, Sweden, assignor to AB Volvo, Goetborg, Sweden

Filed Nov. 8, 1983, Ser. No. 549,729

Int. Cl.³ F16L *11/08*

U.S. Cl. 138—126 **3 Claims**



1. Cable jacket, in particular a rubber jacket for a welding cable and adapted to enclose groups of electrical conductors and coolant ducts for conducting pressurized medium for cooling the cable, comprising a first inner rubber layer, at least one reinforcement layer of warp-knit type radially outwardly of said first layer, a second intermediate rubber layer located radially outwardly of said reinforcement layer, at least one cord helically wound radially outward said reinforcement layer, said cord consisting of a twined string, the spacing between adjacent cord windings measuring in the longitudinal direction of the jacket about 2–8 mm, and an outer rubber layer radially outwardly of said cord, the reinforcement warp-knit layer and the cord being vulcanized into their respective adjacent rubber layers such that in the finished jacket a radial distance is maintained between the warp-knit layer and the cord.

4,499,927

TWO-PLY SCREEN FOR THE SHEET FORMING ZONE OF A PAPERMAKING MACHINE

Georg Borel, Reutlingen, Fed. Rep. of Germany, assignor to Hermann Wangner GmbH & Co KG, Fed. Rep. of Germany

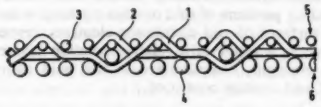
Continuation of Ser. No. 303,331, Sep. 18, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,015

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036409

Int. Cl.³ D03D *15/00, 15/02;* B21F *1/10;* B10D *39/08*

U.S. Cl. 139—425 A **2 Claims**

1. A two-ply fabric for the sheet forming zone of a papermaking machine comprising a plurality of weft filaments arranged in pairs one over the other and a plurality of warp filaments wherein all of said warp filaments are woven into the top ply to reduce marking and increase retention, a first portion of the warp filaments are woven into the top ply as well as



into the bottom ply of said fabric and a second portion of the warp filaments are woven only into the top ply of said fabric with the number of warp filaments in the top ply being at least twice that contained in the bottom ply.

4,499,928

CABLE BANDING MACHINE

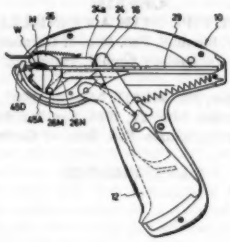
Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co. Ltd., Tokyo, Japan and Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Mar. 27, 1984, Ser. No. 593,994

Claims priority, application Japan, Apr. 6, 1983, 58-59316

Int. Cl.³ B21F *9/02, 45/00;* B29C *17/00*

U.S. Cl. 140—93.2 **9 Claims**

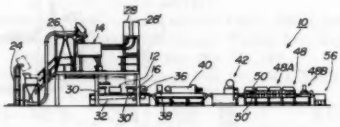


1. A cable banding machine of the type with which a machine body broadly resembling a pistol receives supply of strap-type banding elements individually comprising a strap body having interlockable male and female members at one and the other ends thereof respectively and, when an operation lever provided to a grip handle is triggered, the banding elements are fed one at a time toward a nose end portion of the machine body and applied about a plurality of cables or the like to be banded altogether and received on a front end portion of the machine body, and then fastened with the male and female members interlocked to accomplish banding, the machine comprising a pusher member driven through triggering of the operation lever to move in a guide path in the machine body from a rear end portion to a nose end portion of the machine body while pushing a banding element, a stopper for fixing an end portion of the banding element at a front end portion in the guide path during a banding operation, and a pusher lever pivotally supported at a front end portion of the pusher member and having a bending face along its front edge by which, after the movement of the banding element is stopped by the stopper, the male and the female members of the banding element are interlocked by the pivoting movement of the pusher lever.

4,499,929
PROCESS OF PRODUCING A PLATE FOR A LEAD STORAGE BATTERY

Toshiaki Shima, Osaka; Naozi Hamamuro, Nabari; Shinichi Ikari, Kumagaya, and Tuneo Fuzishiro, Nabari, all of Japan, assignors to Shin-Kobe Electric Machinery Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1981, Ser. No. 310,049
Claims priority, application Japan, Oct. 13, 1980, 55/141974
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1.1 14 Claims

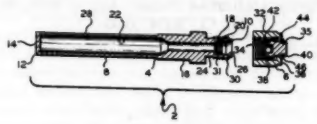


1. A process of producing a plate for a lead storage battery comprising the steps of casting a plate grid of lead material; molding a frame of acid-resisting plastic material which is to surround said plate grid; placing said plate grid into said frame to form a plate substrate; preparing a paste of lead oxide which is to be active material; filling said plate substrate with said paste on both sides of said plate substrate; partly drying said paste filled in said plate substrate; placing an acid-resisting fiber mat onto both sides of said plate substrate so that said plate substrate filled with said plate is covered with said fiber mat; and thermally adhering said fiber mat to both sides of said frame of said plate substrate whereby said plate is completed.

4,499,930
METHOD FOR STORING GAS SAMPLES

John P. Walters, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 286,311, Jul. 24, 1981, Pat. No. 4,402,911.
This application Feb. 28, 1983, Ser. No. 470,800
Int. Cl.³ B67C *5/00*
U.S. Cl. 141—8 2 Claims



1. A method for storing a soil gas sample comprising:

(a) providing an apparatus comprising a tubular member having a closed end, an open end, an interior surface and an exterior surface, the interior surface having a generally annular shoulder facing the open end and positioned near the open end and a generally frustoconical surface diverging toward the open end positioned between the shoulder and the end, the exterior surface of the tubular member being provided with threads adjacent its open end; and a resiliently pierceable septum positioned against the annular shoulder and forming a partition across the interior surface of the tubular member, an interior volume being defined by the septum and tubular member which is in the range of from about 1/10 to about 100 cubic centimeters, said interior volume being evacuated to a pressure of less than about 10 torr;

(b) injecting a sufficient amount of soil gas sample into the interior volume of the apparatus to provide a pressure of from about 800 to about 4000 torr of soil gas;

(c) positioning a plug having a frustoconical surface with its frustoconical surface against the frustoconical surface of the tubular member, the plug further having an annular flange facing oppositely from the frustoconical surface;

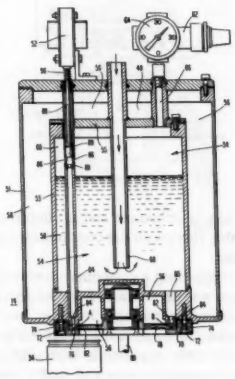
(d) connecting a drawdown nut to the open end of the tubular member, said drawdown nut having a threaded interior surface and a flange extending at least partially across its interior surface connecting the flange of the plug; and

(e) after said injecting, tightening the drawdown nut to contact the annular flange of the plug with the annular flange of the drawdown nut to urge the frustoconical surface of the plug against the frustoconical surface of the tubular member to seal the inside of the tubular member from the outside.

4,499,931
NITROGEN INJECTOR SYSTEM

Joseph Urban, Pleasantville, N.Y., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Nov. 15, 1982, Ser. No. 441,636
Int. Cl.³ B65B *3/10*
U.S. Cl. 141—67 18 Claims



1. A liquid nitrogen injector system for dispensing liquid nitrogen to a series of moving containers of the type having:

a liquid nitrogen storage unit;

a liquid nitrogen injector unit;

a container conveyor for transporting containers in said series to said injector unit;

a means for transferring liquid nitrogen from said storage unit to said injector unit;

said injector unit comprising:

a nitrogen receptacle having

a first portion for nitrogen in the liquid phase; and

a second portion for nitrogen in the gaseous phase, said gaseous phase nitrogen being at a pressure exceeding atmospheric pressure;

an injector orifice;

a distributing disk having metering apertures radially disposed therein, said disk being rotatable with respect to said injector orifice, said distributing disk normally blocking said injector orifice, said apertures receiving a metered amount of liquid nitrogen from said first portion of said receptacle;

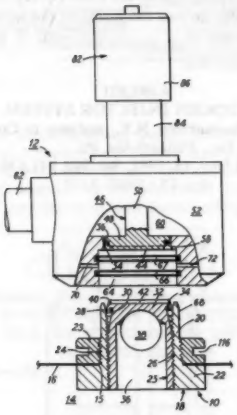
means for rotating said disk and for transporting said metered amount to a position adjacent said orifice, said orifice being unblocked when said metered amount is in said position; and

ejecting means pneumatically connected to said second portion of said receptacle for ejecting said metered amount from said unblocked orifice by the pressure of said gaseous nitrogen.

4,499,932
SEPARABLE COUPLINGS FOR CONTAINERS

John A. Perigo, Hailey, and John E. Divall, Grove, both of England, assignors to Metal Box p.l.c., Berkshire, England

Filed Feb. 2, 1983, Ser. No. 463,238
Claims priority, application United Kingdom, Feb. 2, 1982, 8202969
Int. Cl.³ B65B 3/04
U.S. Cl. 141—91 10 Claims



1. In combination, a container and a coupling member removably engageable therewith for conducting a product to or from said container,

said container comprising a container closure having a container passage and a container valve for opening and closing said container passage,

said coupling member comprising a valved passage means and being removably engageable with said container closure when said passage means and said container passage are both closed,

said coupling member including valve actuating means,

said valve actuating means being inoperable to open said valved passage means when said coupling member and said container closure are out of interengagement,

said valve actuating means being operably connectible with said container valve, when said coupling member and said container closure are interengaged, for moving said container valve from a closed position to an open position,

said container valve including means for opening said valved passage means in response to said container valve being opened.

4,499,933
MANUAL WORK-FEEDING DEVICE AND GUARD BODY FOR SHAPING MACHINES

Monty R. Thompson, 1015 E. Hyman, Aspen, Colo. 81611

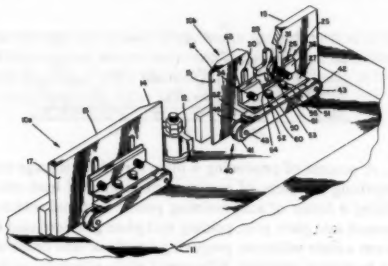
Filed Jul. 21, 1982, Ser. No. 400,278
Int. Cl.³ B27C 5/04
U.S. Cl. 144—134 A 7 Claims

1. A manual work feeding device and guard body for a shaping machine including a work table and a cutting tool mounted on said work table, comprising:

a supporting fence having a pair of substantially parallel, substantially vertical slots;

a mounting frame secured to said supporting fence by two interconnecting members extending through said pair of vertical slots in said supporting fence so as to position said mounting frame over a workpiece on said work table, said mounting frame being vertically adjustable within the limits of said pair of vertical slots in said supporting fence, said mounting frame further comprising a horizontal portion having a pair of substantially parallel, substantially horizontal slots, said pair of horizontal slots being aligned so as to be substantially perpendicular to said supporting fence;

a roller assembly comprising a pair of rollers, said roller assembly being mounted upon said mounting frame by a first pair of threaded members extending through said pair of horizontal slots in said horizontal portion of said mounting frame so that said rollers extend therebelow and come into contact with said workpiece on said work table, said roller assembly being horizontally adjustable within the limits of said pair of horizontal slots in said horizontal portion of said mounting frame so as to direct said workpiece against said supporting fence; and

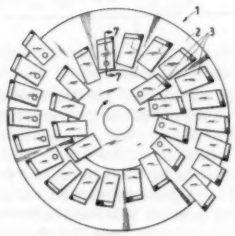


resilient means for urging each of said rollers against the worpiece, so as to depress the workpiece to the work table as the workpiece is simultaneously directed against said supporting fence.

4,499,934
CUTTER FOR SQUARE TIMBER HEWING MACHINE

Kauko Rautio, 52700 Mäntyharju, Finland

Continuation of Ser. No. 290,316, Aug. 5, 1981, abandoned. This application Dec. 27, 1983, Ser. No. 565,830
Claims priority, application Finland, Aug. 6, 1980, 802468
Int. Cl.³ B27C 9/00
U.S. Cl. 144—176 4 Claims



1. A cutter for square timber hewing, comprising: a cutter disk shaped like a truncated cone and having a mantle surface; multiple cutter bits affixed to said cutter disk on said mantle surface and arranged in consecutive succession after each other in a helical configuration, so that cutting takes place by each said cutter bit in turn starting at the outer periphery of said cutter disk and proceeding inwardly, each of said cutter bits having two cutting edges which lie on each other's extension and define an obtuse angle therebetween, said cutter bits arranged so that a first bit cutting edge moves parallel with the grain of a timber being cut and the other cutting edge moves obliquely with reference to the grain of the timber, wherein

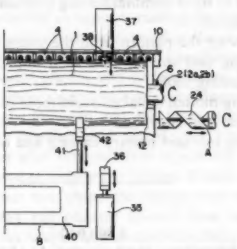
each cutter bit is affixed to the cutter disk so that the cutter bit first edge cutting parallel with the direction of the timber grain extends towards the center of the cutter disk, and an extension of said cutter bit first edge is used to affix said cutter bit to the cutter disk, the mantle surface of the cutter disk being provided with a recess adjacent to the bit cutting edges for chip accommodation and whereby, hewing of the timber is effected by feeding the timber trunk in between two opposing rotating cutters and chips produced from the hewing are flung outwardly without accumulating on any surface of the cutter disk.

4,499,935

VENEER LATHE

Katsuji Hasegawa, Nagoya, and Yasuhiro Ibuki, Ohbu, both of Japan, assignors to Meinan Machinery Works, Inc., Japan

Filed Dec. 21, 1982, Ser. No. 451,749
Claims priority, application Japan, Dec. 28, 1981, 56-211649
Int. Cl.³ B27L *5/02*
U.S. Cl. 144—209 R **5 Claims**



1. A veneer lathe for turning a log to cut off a veneer sheet therefrom comprising means for supporting and centering a log on said lathe, a boring mechanism having a retractable boring tool disposed on at least one side of a supported and centered log in facing relation to a butt end thereof operable to axially form a center bore in the log, means for feeding the log having the center bore therein to a predetermined position, spindle means at said predetermined position adapted to extend into the center bore axially formed in the log for rotatably supporting said log on the lathe at said predetermined position, a cutting tool adapted to move toward and away from said rotatably supported log, a rotary roller having a plurality of annular driving members each having a plurality of piercing members arranged therearound, said annular driving members being disposed around said roller at intervals along an axial direction of said rotary roller, said rotary roller being disposed substantially in parallel to an edge of the cutting tool and so as to enable said piercing members to thrust into the circumference of the log at a position near the edge of the cutting tool, a driving unit for driving said rotary roller, and a pressure member disposed on at least one side of each driving member to press the log slightly ahead of the tool edge.

4,499,936

COLLAPSIBLE BOW SAW

Göran A. Nilsson, P.O. Box 61, 82022 Sandarne, Sweden

Filed Sep. 27, 1983, Ser. No. 536,254
Claims priority, application Sweden, Oct. 13, 1982, 8205812
Int. Cl.³ B27B *21/00*
U.S. Cl. 145—33 E **2 Claims**

1. In a collapsible bow saw having an elongated saw blade, having a hollow main element with an axis and ends, having two hollow end elements with ends and with cross sectional dimensions that are different from the cross sectional dimensions of the main element so as to allow the elements to be telescoped into each other and to allow the blade to be telescoped into a sheltered position within the elements when the saw is not assembled for use, and having connecting means for connecting the end elements to the ends of the main element when the saw is assembled for use, the blade being tightly stretched between the end elements at a position spaced apart from the main element when the saw is assembled for use so as to form a rigid frame as long as tensile stress is maintained in the blade, the improvement comprising:

said hollow main element and hollow end elements have internal internal cavities and have box profiles with closed cross sections, the cavity in the main element being wider than the maximum width of the blade and the exterior of the main element having cross sectional dimensions that are smaller than the cross sectional dimensions of the cavities in the end elements so that the main element is telescopically movable into the end elements when the saw is not assembled for use; and

said connecting means includes a chamfered extremity having a protrusion provided on the main element at each end thereof and first and second transverse flanges provided on the main element at each end thereof, the chamfered extremity being disposed between the first and second transverse flanges and the protrusion being closer to the first transverse flange than the second, the chamfered

extremity being disposed at an angle with respect to the axis of the main element, and further includes two side flanges provided on each end element adjacent an end thereof and third and fourth transverse flanges provided on each end element adjacent an end thereof, the side flanges being spaced apart and the third and fourth flanges being spaced apart between the side flanges, the third transverse flange terminating in an end edge and the fourth transverse flange having a hole which is spaced apart from the end of the end element, when the saw is assembled for use each end element being disposed at an obtuse angle with respect to the axis of the main element, said obtuse angle being substantially the same as the angle between the axis of the main element and the chamfered extremity that is closest to the end element, and when the saw is assembled for use each end of the main element being disposed between the side flanges of a respective end element with the first transverse flange abutting the end edge of the respective end element, with the protrusion extending into the hole of the respective end element, and with the chamfered extremity fitting tightly against the fourth transverse flange of the respective end element.

4,499,937

WINDOW SHADE SYSTEM FOR REDUCING HEAT TRANSPORT THROUGH WINDOWS

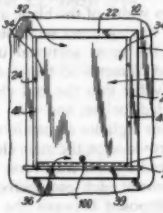
Martin Waine, Riverside; Edward T. Rude, Fairfield, and Jules Nisenson, Stamford, all of Conn., assignors to General Clutch Corp., New York, N.Y.

Filed Jan. 21, 1982, Ser. No. 341,302
Int. Cl.³ E06B *7/16*
U.S. Cl. 160—41 **5 Claims**

1. A window shade system for a window housed within a frame including a top end, generally planar side surfaces, and a sill having a top surface, which comprises:

a shade configured to substantially overlie a window, said shade including a top end, side edge sections, and a bottom longitudinal edge section;

said bottom longitudinal edge section including a first depending longitudinal pocket, and a second longitudinal pocket configured to substantially enclose said first longitudinal pocket, said enclosing pocket being spaced from



said first longitudinal pocket to define a longitudinal void between said pockets, so that when said shade is positioned adjacent the sill, said enclosing pocket conforms to the contour of the top surface of the window sill to frictionally seal the shade within the window frame, thereby preventing the passage of air beneath the window shade between the bottom longitudinal edge section of the shade and the sill enhancing the insulating capacity of the shade.

4,499,938

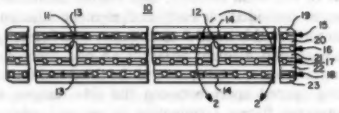
PATTERNED METAL BLIND SLAT AND METHOD AND APPARATUS FOR PRODUCING THE SAME

Andrew J. Toti, 311 W. River Rd., Modesto, Calif. 95351

Filed Jan. 13, 1983, Ser. No. 457,682

Int. Cl.³ B21D *53/00*

U.S. Cl. 160—236 **30 Claims**



1. In a metal slat for use in a venetian-type blind and having a pair of cord receiving transverse slots formed therethrough at respective end sections thereof, said slots defining narrowed slat material regions between each end of each slot and an associated adjacent marginal edge of said slat, the improvement comprising an embossed rib formed in said slat at each of said narrowed slat material regions, each said rib extending longitudinally on said slat and having an overall length substantially greater than the width of said slots, and a plurality of separated longitudinal rows of embossed ribs formed on said slat in a continuous in-and-out pattern of successive ribs in each row and having a substantial depth relative to the thickness of the slat.

4,499,939

PRODUCTION OF MACHINE ELEMENTS WITH PROTECTION CAGES CONNECTED THEREWITH BY MEANS OF A SINGLE CASTING OPERATION

Giulio Marton, Pavia, Italy, assignor to Necchi, Societa per Azioni, Pavia, Italy

Continuation of Ser. No. 267,919, May 28, 1981, abandoned. This application Dec. 7, 1983, Ser. No. 558,705

Claims priority, application Italy, Jun. 3, 1980, 42915 A/80

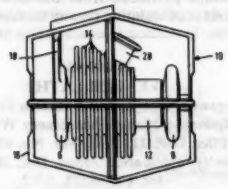
Int. Cl.³ B22C *9/00, 9/02*

U.S. Cl. 164—23 **1 Claim**

1. Process for the mass production of elements with protective cages connected therewith from a single casting operation comprising:

(a) creating a hardened shell containing a casting impression of the outer surface of the casting to be reproduced;

(b) forming by a pattern in a green sand casting mold a shell impression corresponding to the print of said shell, said pattern having raised portions for creating impressions of



a cage to form communicating conduits with said casting impression;

(c) removing the pattern from the green sand casting mold;

(d) placing said shell in said shell impression in the green sand casting mold;

(e) pouring molten metal into said mold to create said casting and then said cage; and

(f) shaking out said unitary casting and cage.

4,499,940

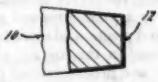
CASTING PROCESS INCLUDING MAKING AND USING AN ELASTOMERIC PATTERN

Robert T. Hall, Milford, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Aug. 1, 1983, Ser. No. 518,849

Int. Cl.³ B22C *7/02, 9/04*

U.S. Cl. 164—36 **10 Claims**



1. A casting process comprising the steps of

fabricating a master pattern from an electrically conductive material,

plating said master pattern with a metal,

chemically dissolving said master pattern to leave a metallic shell mold,

reinforcing said metallic shell mold exteriorly thereof,

pouring an elastomeric compound into said metallic shell mold to form an elastomeric pattern,

stripping the elastomeric pattern from said metallic shell mold,

coating said elastomeric pattern with a non-metallic material to form a non-metallic shell mold,

removing said elastomeric pattern from said non-metallic shell mold,

pouring a metal into said non-metallic shell mold to form a metallic casting, and

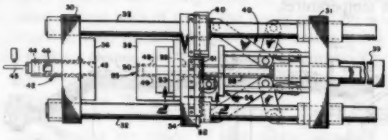
retrieving said metallic casting from said non-metallic shell mold by destroying said non-metallic shell mold.

4,499,941

MODIFIED PRESSURE CASTING PROCESS AND MACHINE

Walter M. Goldhamer, 23300 Shaker Blvd., Cleveland, Ohio 44122

Division of Ser. No. 150,596, May 16, 1980, Pat. No. 4,354,545.
This application Jun. 30, 1982, Ser. No. 393,686
Int. Cl.³ B22D 17/10
U.S. Cl. 164—313 26 Claims



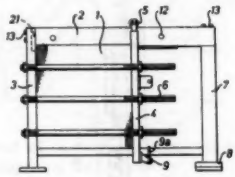
1. A die casting machine comprising a fixed platen and a movable platen adapted to support mating die halves, surface means defining a cold chamber extending through said fixed platen, a shot piston in said chamber, a plunger extending through said movable platen, said surface means including an end face of said piston, an end face of said plunger, and axially extending side walls between said end faces, drive means for initially relatively moving said piston and plunger axially toward each other after said chamber is partially filled with a molten metal charge to reduce the volume of said chamber and thereby to compact and shape the charge and for thereafter moving said piston and plunger spaced from each other in tandem to move the shaped and compacted change, and means for controlling the spacing.

4,499,942

PLATE HEAT EXCHANGER

John Allison, Crawley, England, assignor to The A.P.V. Company Limited, Crawley, England

Continuation of Ser. No. 165,342, Jul. 2, 1980, abandoned. This application May 25, 1983, Ser. No. 496,676
Claims priority, application United Kingdom, Jul. 6, 1979, 7923605; May 1, 1980, 8014541
Int. Cl.³ F28F 3/08
U.S. Cl. 165—78 17 Claims



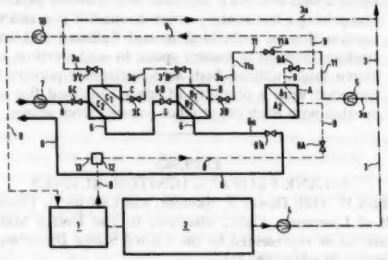
1. In a plate heat exchanger comprising a frame including a fixed head and a fixed supporting pillar, and a top rail extending between said head and said supporting pillar, and a pack of plates carried by said top rail and compressed between said fixed head and a movable follower mounted for movement on the top rail; the improvement comprising means for attaching the top rail to the fixed head and fixed supporting pillar in a readily releasable manner so that the top rail and pack of plates can be lifted bodily and together from the head and supporting pillar, the follower being releasably mounted on the top rail, and means for temporarily accommodating the follower on the support pillar when the top rail is removed to position the follower clear of the top rail and pack of plates so that the rail and pack of plates can be lifted as a unit.

4,499,943

APPARATUS HAVING A DRYER FOR ORGANIC SUBSTANCES

Otmar U. Schäfer, Pienzenauerstrasse 9, 8000 Munich 80, Fed. Rep. of Germany

Filed Jun. 14, 1983, Ser. No. 504,178
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222700
Int. Cl.³ F23L 15/02; F23D 17/00; F24D 23/02
U.S. Cl. 165—95 6 Claims



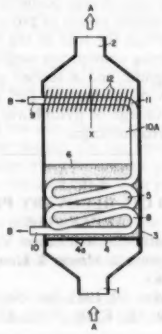
1. A plant for drying organic substances, especially wood chips or the like, comprising, a combustion chamber for generating hot gas and connected to a dryer for said substances, at least one indirect heater exchanger having primary and secondary sides, first duct means for passing contaminated exhaust gases from said dryer through the primary side of said heat exchanger during a normal operation phase, second duct means connectable to said dryer for bypassing said heat exchanger during a cleaning phase, third duct means connectable to said combustion chamber and the primary side of said heat exchanger to direct a portion of the hot gas thereto during the cleaning phase and return the same to said combustion chamber, and valve means to close said second and third duct means during the normal operation phase and to open said second and third duct means and close said first duct means during the cleaning phase for the heat exchanger.

4,499,944

HEAT EXCHANGERS INSTALLED IN FLUIDIZED BEDS

Takashi Komakine, Kawaguchi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 16, 1983, Ser. No. 466,945
Claims priority, application Japan, Feb. 18, 1982, 57-24929; Jun. 29, 1982, 57-110797; Aug. 11, 1982, 57-138570
Int. Cl.³ F28C 3/16; F28D 13/00
U.S. Cl. 165—104.16 5 Claims



1. A heat exchanger comprising

a vertical casing having a lower fluid inlet port and an upper fluid exit port,

a fluidized bed formed on a perforated distribution plate positioned in said casing above said inlet port, and

a serpentine heat transfer pipe means embedded in said fluidized bed, and traversed by another fluid to be heated or cooled by said first mentioned fluid,

said heat transfer pipe means having a construction such that said first mentioned fluid and particles of said fluidized bed do not move straightforwardly from said inlet port toward said exit port, and said heat transfer pipe means comprising a horizontal portion connected in series with a portion thereof embedded in said fluidized bed and extending through a vacant space in said vertical casing above said fluidized bed, said horizontal portion being provided with a plurality of spaced inclined fins which overlap with each other when viewed from above.

4,499,945

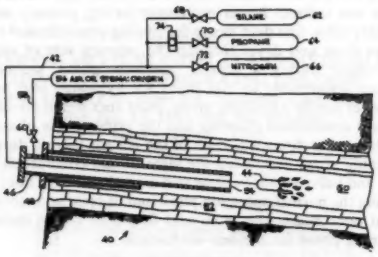
SILANE-PROPANE IGNITOR/BURNER

Richard W. Hill; Dewey F. Skinner, and Charles B. Thorsness, all of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 26, 1983, Ser. No. 498,438

Int. Cl.³ E21B *29/02, 36/02*

U.S. Cl. 166—50 **8 Claims**



1. Apparatus for producing a controlled burn in an injection pipe in a horizontal borehole in an underground coal gasification process, comprising:

a small diameter retractable tube which is insertable into the borehole;

a burner tip on the tube which is positioned at the point where the controlled burn is desired to ignite coal or cut the pipe; and

gas supply means operatively connected to the tube including a first gas supply means to provide a charge of pyrophoric gas through the tube to the burner tip to contact oxygen containing combustion supporting gas in the pipe and thereby ignite, and a second gas supply means to provide a flow of combustible fuel gas through the tube following the charge of pyrophoric gas to be ignited by the burning pyrophoric gas.

4,499,946

ENHANCED OIL RECOVERY PROCESS AND APPARATUS

Alan B. Martin, Beattyville, and Ernest V. Jackson, Lexington, both of Ky., assignors to Mason & Hanger-Silas Mason Co., Inc., Lexington, Ky.

Filed Mar. 10, 1981, Ser. No. 242,372

Int. Cl.³ E21B *36/02, 43/24*

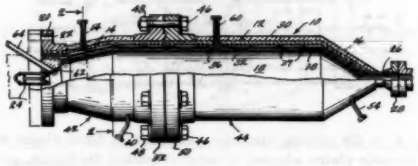
U.S. Cl. 166—57 **8 Claims**

1. Apparatus for generating combustion gases at high pressures and high temperatures and steam for selective injection into subterranean formations to enhance recovery of hydrocarbons and other fluids therefrom, comprising:

means defining a pressure-tight elongated combustion reactor having a restricted outlet at one end thereof for the discharge of combustion gases under high pressure;

refractory material lining the wall of said reactor substantially throughout the interior thereof;

burner means at the other end of said reactor for the supply of fuel and air thereto under high pressure to generate combustion gases in said reactor at high pressures and high temperatures;



means for introducing water into the combustion flame in an amount sufficient only for reducing the temperature of the flame to a level non-destructive of said refractory material;

means defining a steam boiler detachably connectable to said reactor outlet for the passage therethrough of, and the heating thereof by, the combustion gases created in said reactor to generate steam; and

means for selectively injecting such steam into the formation with or alternatively to the gases.

4,499,947

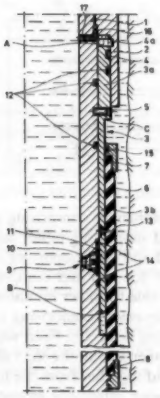
PACKER FOR SEPARATION OF ZONES IN A WELL BORE

István Zsóka; László Madar, both of Budapest, Hungary; Anatoly A. Cübin, Moscow, U.S.S.R.; Albert A. Gaivoronsky, Moscow, U.S.S.R.; Lev H. Farukshin, Moscow, U.S.S.R.; Piotr A. Morzsic, Luberci, U.S.S.R.; Aleksandr I. Lisov, and Vladilen A. Galusztainc, both of Moscow, U.S.S.R., assignors to Magyar Szenhidrogenipari Kutatofejleszto Intezet, Szazhalombatta, Hungary and Vsesojuzny Nauchno-Issledovatelsky Institut Burovoi Technici, Moscow, U.S.S.R.

Filed Dec. 12, 1983, Ser. No. 560,264

Int. Cl.³ E21B *33/127*

U.S. Cl. 166—179 **5 Claims**



1. A packer for separation of zones behind casing in a well bore comprising a casing string serving as mandrel, for the packer, an expandable packing element, first and second

sleeves tightly fixed to the peripheries of said packing element, the first sleeve is sealed and movable in respect of said casing string, the second sleeve is fixed to said casing string, characterized in that a collar (2) is tightly fixed to said casing string (1), a sleeve plug (3) is provided which is sealed against and slides on said casing string (1) from a starting position to a lower position and further to a final position which has a thicker upper part (3*a*) and a thinner lower part (3*b*) made of one piece, the upper part (3*a*) is slidingly arranged at least partially between said casing string (1) and said collar (2) and is sealed against both of them, the lower part (3*b*) is slidingly arranged at least partially between said casing string (1) and said packing element (6), and is sealed against both of them,

said first sleeve is sealed against and slides on said sleeve plug (3),

a non-return valve (9) is provided in said casing string (1) connecting the inside of said casing string (1) and the space between said casing string (1) and said sleeve plug (3),

a bore (13) is made in the lower portion (3*b*) of said sleeve plug (3) connecting the opening of said non-return valve (9) and the space between said packing element (6) and said sleeve plug (3) in its lower position,

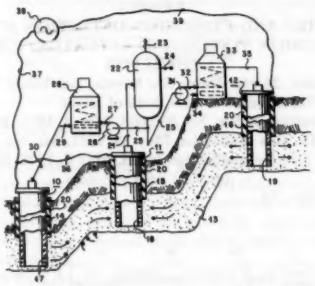
a bore (17) is made in said casing string (1) above the upper portion (3*a*) of said sleeve plug (3) in its starting position.

4,499,948

VISCOUS OIL RECOVERY USING CONTROLLED PRESSURE WELL PAIR DRAINAGE

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 12, 1983, Ser. No. 560,695
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—248 **11 Claims**



1. A method of recovering viscous oil from a subsurface formation comprising the steps of:

a. providing a first injection well and a first production well which extend into and communicate with said formation, said first injection well and said first production well being spaced laterally one from the other by a predetermined first distance, said first injection well and said first production well being electrically connected to each other by an electrically conductive metallic flow path;

b. injecting aqueous fluid into said first injection well at a predetermined first pressure in a manner such that said aqueous fluid flows from said first injection well through said formation and into said first production well, said first pressure being below the shut-in formation pressure of said first production well; and

c. passing electrical current from said first production well and said first injection well through at least a part of said formation.

4,499,949

COMBINED SURFACE AND IN SITU TAR SAND BITUMEN PRODUCTION

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,817
The portion of the term of this patent subsequent to Aug. 9, 2000, has been disclaimed.
Int. Cl.³ E21B *43/243*
U.S. Cl. 166—260 **8 Claims**

1. The invention is a method for the recovery of hydrocarbons (bitumen) from a tar sand deposit having a minable tar sand formation and an unminable tar sand formation in an area proximate to the area of the minable formation, said unminable tar sand formation penetrated by at least one injection well and at least one spaced-apart production well, said injection well and production well being in fluid communication with a substantial portion of the unminable formation, comprising:

(a) mining the tar sands from the minable formation;

(b) conveying the mined tar sands to a processing operation wherein the tar sands are processed to recover bitumen and by-product hydrogen sulfide;

(c) injecting a predetermined amount of said hydrogen sulfide into said unminable tar sand formation via said injection well;

(d) initiating an in-situ combustion reaction in the unminable formation by injecting an oxygen containing gas into the injection well; and

(e) continuing to inject an oxygen containing gas into the injection well to propagate the combustion zone through the formation to stimulate recovery of hydrocarbons from the formation via the production well.

4,499,950

WELLHEAD STABILIZATION

Bruce J. Watkins, Rancho Palos Verdes, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed May 27, 1983, Ser. No. 499,069
Int. Cl.³ E21B *33/043*
U.S. Cl. 166—285 **7 Claims**

1. In a sub-sea well assembly of the type having an outer member mounted at the top of the well, an inner member protruding upwardly from the outer member and having connection means for connecting to the riser equipment extending to a drilling vessel, the lower end of the inner member being connected to a string of casing, an improved means for mounting the inner member within the outer member, comprising in combination:

supporting means for supporting with the outer member substantially all of the weight on the inner member and means for preventing substantially all vertical movement of the inner member with respect to the outer member;

a plurality of slips located in two vertically spaced-apart sets in an annular space between the outer member and the inner member; and

mounting means for mounting the slips for sliding movement between a contracted position when the inner member is being lowered into the outer member and an expanded position wedging between the inner member and the outer member after the weight on the inner member is supported by the supporting means, to prevent side-to-side movement of the inner member with respect to the outer member.

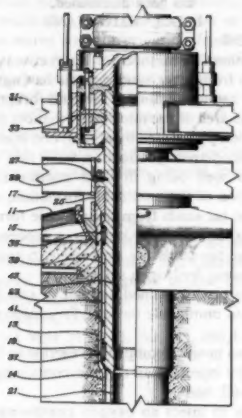
3. In a sub-sea well assembly of the type having a wellhead housing mounted at the top of the well, an improved method of mounting a wellhead within the wellhead housing, comprising in combination:

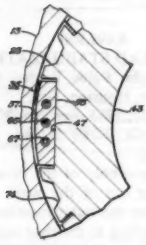
mounting a plurality of slips in two vertically spaced-apart sets around an exterior wall of the wellhead so as to be movable between a contracted position and an expanded position of larger diameter;

mounting a locking means to the wellhead for supporting the

weight of the wellhead on the wellhead housing and also for preventing upward movement of the wellhead;

securing casing to the lower end of the wellhead and lowering the casing and wellhead into the well until the locking means engages the wellhead housing to prevent vertical movement of the wellhead; then





moving the slips downward to wedge between the wellhead and the wellhead housing, to prevent side-to-side movement of the wellhead with respect to the wellhead housing; then

pumping cement down the casing to return upward between the wellhead and wellhead housing and through the slips; then

allowing the cement to harden.

4,499,951

BALL SWITCH DEVICE AND METHOD

Roy R. Vann, Odessa, Tex., assignor to GEO Vann, Inc., Houston, Tex.

Continuation of Ser. No. 175,515, Aug. 5, 1980, abandoned. This application May 9, 1983, Ser. No. 493,018

Int. Cl.³ E21B *43/11*

U.S. Cl. 166—297 **34 Claims**

10. A well completion apparatus mounted on a pipe string extending into a slanted cased borehole comprising:

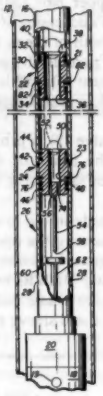
a perforating gun having a firing head and disposed on the pipe string in proximity of a hydrocarbon formation;

a tubular member series connected in the pipe string above said firing head;

said tubular member, firing head and perforating gun having their longitudinal axis substantially deviated from vertical due to the slanted cased borehole so as to preclude dropping a weight through the pipe string to impact and actuate said firing head;

vent means in said tubular member for opening the tubing string to fluid flow prior to the detonation of the perforating gun;

a piston reciprocably mounted within said tubular member and having an axial flow passageway formed therethrough;



circulation ports formed in said tubular member below said piston; and

a ball circulated downhole through the pipe string for sealing said axial flow passageway whereby fluid pressure is applied to said piston causing said piston to engage said firing head and detonate said perforating gun.

4,499,952

FIRE AND EXPLOSION DETECTION AND SUPPRESSION SYSTEM AND ACTUATION CIRCUITRY THEREFOR

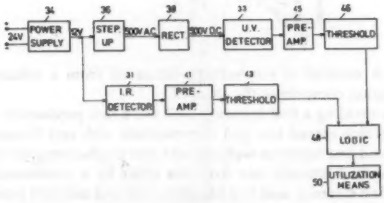
Dov Spector, 36 Har-Dafna St., Savion, and Yehiel Spector, 5 Avner St., Zahala-Tel Aviv, both of Israel

Continuation of Ser. No. 902,608, May 3, 1978, Pat. No. 4,270,613. This application May 29, 1981, Ser. No. 268,236

Claims priority, application Israel, May 3, 1978, 54138

Int. Cl.³ A62C *37/18*

U.S. Cl. 169—61 **18 Claims**



1. For use in a fire and explosion suppression system comprising a plurality of detectors and a plurality of suppression elements communicating with a common volume to be protected, actuation circuitry comprising:

means, responsive to the number of detectors detecting and to the elapsed time between detections and being operative in a first mode of operation, for operating said suppression elements in response to differing types of detection including:

first means operative in response to detection of a first type said first type characterized in that a first number

of detectors detect within a first elapsed time span, for operating a first number of suppression elements; and

second means operative in response to detection of a second type, said second type characterized in that a second number of detectors detect within a second elapsed time span for operating a second number of suppression elements greater than said first number of suppression elements,

said detection of said second type being characterized in that at least one of the following criteria is fulfilled:

a. said second number of detectors which detect during said second elapsed time span exceeds said first number of detectors which detect during said second elapsed time span; and

b. said second time span is less than said first time span.

4,499,953

APPARATUS FOR DRILLING ROCK

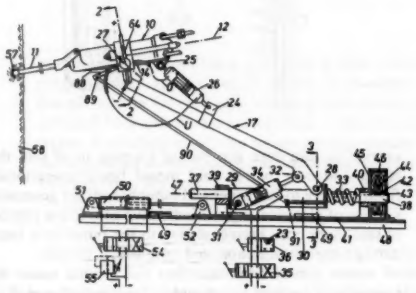
Alexis Molin, Saltsjöbaden, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 304,984, Sep. 23, 1981, abandoned, which is a continuation of Ser. No. 916,492, Jun. 19, 1978, abandoned. This application Oct. 7, 1983, Ser. No. 540,097

Claims priority, application Sweden, Jun. 21, 1977, 7707139-7

Int. Cl.³ E21B *15/04*

U.S. Cl. 173—43 **11 Claims**



1. Rock drilling apparatus comprising:

a drill boom,

a rock drilling machine equipped with a drill steel and pivotally carried on the drill boom at a fixed distance from and pivotally about a first pivot means transverse to the boom,

a boom supporting structure for pivotally supporting the drill boom about a second pivot means parallel with said first pivot means,

a pressure fluid driven positioning motor connected to said drill boom for pivoting during drilling said rock drilling machine and drill steel in unison about said first pivot means and about the tip of the drill steel in the hole being drilled so as to transmit to said first pivot means a corrective feeding movement relative to the desired drilling axis of the hole,

a pressure fluid driven feeding motor separate from said positioning motor connected to said boom supporting structure for moving said drill boom laterally during drilling so as to transmit a main feeding movement via said first pivot means to said rock drilling machine in the general direction of the desired drilling axis,

first sensing means incorporating a first rotary directional control valve element connected to said rock drilling machine for sensing during drilling the actual angular position in space of the rock drilling machine and drill steel relative to said supporting structure,

second sensing means incorporating a second rotary directional control valve element cooperating with said first valve element and selectively adjustable relative to said supporting structure to sense a set angular value parallel with the direction of the desired drilling axis,

angle transmission means between the rock drilling machine and said supporting structure associated with one of said first and second valve elements,

said first and second valve elements forming part of a pressure fluid servo control system connected to control the fluid supply to said positioning motor and having a feedback position wherein said positioning motor adapts said corrective feeding movement to said main feeding movement such that the rock drilling machine is fed and drills the hole closely along the desired drilling axis.

4,499,954

GEOTECHNICAL CONE LUBRICATION APPARATUS AND METHOD

Dennis A. Diggle, 12983 - 80th Ave., Surrey, British Columbia, Canada

Filed Jul. 12, 1983, Ser. No. 513,025

Int. Cl.³ F21B *11/02*

U.S. Cl. 175—21 **10 Claims**

1. A lubricating apparatus for lubricating a string of hollow rods connected to a cone penetrometer within a probe hole as used in geotechnical "in situ" testing, the rods having aligned bores communicating with each other and being of sufficient size to pass drilling fluid therethrough, the lubricating apparatus having an elongated tubular body characterized by:

(a) first and second end portions adapted to be connected to an inner end of the string of hollow rods and to structure adjacent the cone penetrometer respectively,

(b) a longitudinal bore extending along the body and communicating at the first end portion of the body with the bores of the hollow rods,

(c) a plurality of lubricating openings extending from the longitudinal bore to an outer surface of the tubular body, in which a major portion of the outer surface of the body is adapted to be within a maximum cross-section of the cone penetrometer,

(d) a plurality of projections extending from the outer surface of the body so as to be generally adjacent the maximum cross-section of the cone penetrometer, so as to roughen the sidewall of the probe hole,

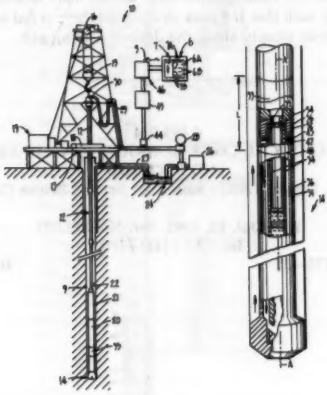
so that drilling fluid within the string of rods passes into the longitudinal bore of the body and is distributed through the plurality of lubricating openings to the outer surface of the body, and passes into side wall of the probe hole to stabilize the probe hole.

4,499,955

BATTERY POWERED MEANS AND METHOD FOR FACILITATING MEASUREMENTS WHILE CORING

Frank L. Campbell, Santa Ana; Dean C. Barnum, Fullerton, and William C. Corea, Placentia, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 12, 1983, Ser. No. 522,923
Int. Cl.[3] E21B 47/09
U.S. Cl. 175—46 11 Claims



1. Apparatus for monitoring detrimental conditions associated with extraction of a core from an earth formation penetrated by a well bore using a core barrel having a rotatable outer cylindrical barrel attached to and operationally rotated by, a drill string, and drilling fluid circulating within said well bore as said core is extracted, wherein rotation of a usually stationary inner core barrel coaxial of the outer core barrel during said extraction of said core and its placement thereof within the cylindrical inner barrel, is used to indicate said associated detrimental coring conditions, comprising;

first means mechanically attached to said core barrel and operationally fitted between said outer and inner core barrels for generating a series of electrical signals indicative of relative rotation of the inner core barrel relative to the outer core barrel during extraction of said core from the formation;

downhole battery means connect to said first means for driving same with a dc current during said coring operations,

second means uphole from said first means and operational connected thereto for responding to said series of electrical signals indicative of said relative inner barrel rotation wherein occurrence of said relative inner barrel rotation causes operations to be initiated to overcome any associated detrimental condition within said well bore.

4,499,956

LOCKING MEANS FOR FACILITATING MEASUREMENTS WHILE CORING

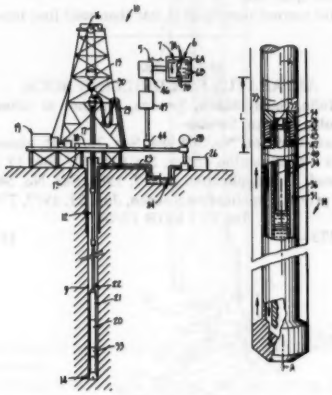
Frank L. Campbell, Santa Ana; Dean C. Barnum, Fullerton, and William C. Corea, Placentia, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 12, 1983, Ser. No. 522,924
Int. Cl.[3] E21B 47/09
U.S. Cl. 175—46 13 Claims

1. Apparatus for monitoring detrimental conditions associated with extraction of a core from an earth formation penetrated by a well bore using a core barrel having a rotatable outer cylindrical barrel attached to and operationally rotated by, a drill string, and drilling fluid circulating within said well bore as said core is extracted, wherein rotation of a usually stationary inner core barrel coaxial of the outer core barrel during said extraction of said core and its placement thereof within the cylindrical inner barrel, is used to indicate said associated detrimental coring conditions, comprising;

locking means disconnectably locking said inner and outer core barrels together during tripping in of said core barrels and said drill string to a selected coring site, said locking means being deactivated by an increase in drilling fluid pressure within said well bore so as to free said inner and outer barrels for independent rotation after said barrels have been correctly positioned at a selected coring site within said well bore;

second means mechanically attached to said core barrel and



carried to said core site during tripping in of said drill string and core barrel, said means being operationally fitted relative to said inner and outer barrels for generating a series of electrical signals indicative of relative rotation of said inner core barrel relative to the outer core barrel during core extraction at said core site;

third means uphole from said first and second means but operationally connected to said second means so as to aid in interpreting said series of electrical signals indicative of said relative inner barrel rotation wherein occurrence of said relative inner barrel rotation causes operations to be initiated to overcome any associated detrimental condition within said well bore.

4,499,957

METHOD FOR REMOVING EARTH CUTTINGS FROM HOLES BEING FORMED BY A PNEUMATICALLY EXHAUSTED DRILL TOOL

Gerald Adcock, 2033 - 3rd Ave. North, Lewiston, Id. 83501

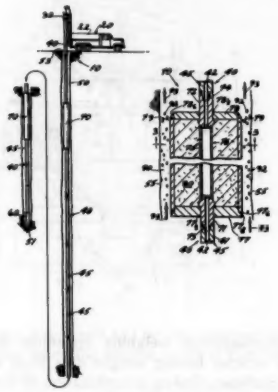
Filed Nov. 22, 1982, Ser. No. 443,231
Int. Cl.[3] E21B 7/18
U.S. Cl. 175—71 1 Claim

1. In a method for drilling holes in the earth using a pneumatically exhausted drill tool mounted at the distal end of an elongated drill string composed of a plurality of drill pipe sections wherein the improvement is a method for removing earth cuttings from the hole with a minimum amount of exhausting pneumatic gas or air without significantly increasing the weight or diameter of the drill string, comprising:

exhausting sufficient pressurized gas from the drill tool to initially flush the earth cuttings from the base of the hole as the cuttings are being formed and to entrain the cuttings in a gas stream along the outside of the drill string; and

intermittently accelerating the gas stream at spaced locations along the drill string by passing the exhausting gas through elongated approximately annularly shaped passageways of reduced cross-sectional flow area formed by

entrained flow accelerators placed intermittently in the drill string; the intermittent entrained flow accelerators being spaced apart approximately 50 to 200 feet and having lengths of between 5 and 35 feet; the entrained flow accelerators being sized to define annular cross-sectional flow areas which are between approximately 20 and 60 percent of the cross-sectional area of the hole; pressurized



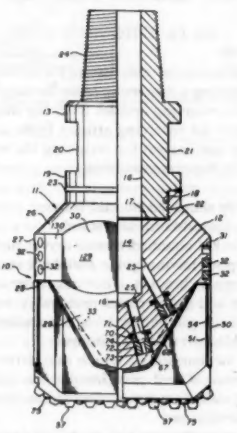
gas from the drill tool being exhausted at flow rates in the range between approximately 12 and 25 standard cubic feet per minute for each square inch of said annular cross-sectional flow area of said passageways to maintain the gas stream at a sufficient velocity to carry the suspended earth cuttings along the outside of the drill string to remove the cuttings from the hole.

4,499,958

DRAG BLADE BIT WITH DIAMOND CUTTING ELEMENTS

Robert P. Radtke, Kingwood, and Wilford V. Morris, Houston, both of Tex., assignors to Strata Bit Corporation, Houston, Tex.

Filed Apr. 29, 1983, Ser. No. 489,934
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **15 Claims**



1. A cutting element for a drag blade bit having a hollow metal bit body open at one end for connection to a drill string and closed at the other end,

said cutting element comprising a metal blade member adapted to be welded to said bit body in a position having forwardly and radially extending cutting edges and longitudinally extending gage edges comprising wear surfaces,

said blade member having a plurality of recesses spaced along said cutting edge,

a plurality of cutters positioned one in each of said recesses,

said cutters each comprising a cylindrical supporting stud of sintered carbide having an angularly oriented supporting surface with a disc-shaped element bonded thereon comprising a sintered carbide disc having a cutting surface comprising polycrystalline diamond;

said blade member cutting edge includes a bevelled surface at substantially the same angle of bevel as the angled surface of said cylindrical supporting stud, and

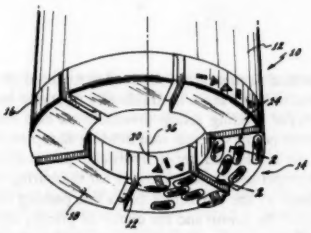
said cutters are positioned in said recesses at a depth such that the flat surfaces of said cutting discs lie in substantially the same inclined plane as said bevelled surface.

4,499,959

TOOTH CONFIGURATION FOR AN EARTH BORING BIT

Richard H. Grappendorf, Riverton, and Jana L. Brown, Orem, both of Utah, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Mar. 14, 1983, Ser. No. 475,168
Int. Cl.³ E21B *10/48*
U.S. Cl. 175—330 **13 Claims**



1. A rotatable bit for use in earth boring comprising:

a matrix body member having portions forming a gage and a face,

said face including a plurality of waterways forming pad means between adjacent waterways,

each said pad means including a plurality of spaced synthetic polycrystalline diamond cutting elements mounted directly in the matrix during matrix formation,

each of said cutting elements being of a predetermined geometric shape and being temperature stable to at least about 1200° C.,

the said cutting elements including a portion received within the matrix body member of said pad means and a portion which extends above the surface of said pad means and which is adapted to form the cutting face of said cutting element,

each cutting element including side faces and a rear face spaced from said cutting face,

matrix material extending above said pad means and forming a plurality of spaced teeth, at least some of said cutting elements being positioned in said teeth,

at least some of said teeth including a trailing support contacting the rear of the associated cutting element,

at least some of said teeth which include a trailing support also including a prepad of matrix material extending above said pad and contacting and at least partially covering the cutting face of at least some of the associated cutting elements,

the side faces of each of the cutting elements received in said teeth being fully exposed above said paid,

the length of said tooth to the rear of said cutting element being greater than the length of said prepad, and

the portion of each of said cutting elements which forms the cutting face of said cutting elements extending more than 0.5 mm above the surface of the corresponding pad.

4,499,960

METHOD FOR MEASURING THE WEIGHT OF BULK GOODS LOADED BY A HYDRAULIC EXCAVATOR

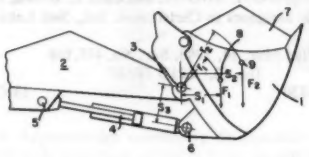
Gerd Ehrich, Monheim, and Eberhard Dobner, Ratingen, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 389,716, Jun. 18, 1982,. This application Apr. 4, 1983, Ser. No. 481,637

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3130901; May 28, 1982, 3220143

Int. Cl.³ G01G *23/37, 19/10, 19/02*

U.S. Cl. 177—25 **4 Claims**



1. A method of measuring the loaded material of a material loading machine having a hydraulically operable loading arm and a material loading scoop pivotable on said loading arm about a pivot point, wherein said holding scoop and said loading arm are connected by a hydraulic piston-cylinder unit located therebetween and apparatus for measuring the bailing angle defined by the horizontal and a line passing through the pivot point of the scoop and the center of gravity of the empty scoop and for measuring the pressure on said hydraulic piston-cylinder unit comprising the steps of:

(a) feeding a computer the following predetermined fixed values;

(i) the weight of the empty scoop;

(ii) the distance from the center gravity of the empty scoop to said pivot point;

(iii) the surface area of the piston of the piston-cylinder unit and the moment distance of said piston-cylinder unit to said pivot point;

(iv) the distance from the center of gravity of the load in the scoop to said pivot point;

(v) the angle between the lines connecting the pivot point to the centers of gravity of the empty scoop and the load in the scoop;

(b) loading material into the scoop;

(c) measuring the pressure in said piston-cylinder unit at least in one position of said loading arm;

(d) measuring said bailing angle at the same position of said loading arm;

(e) providing said measured pressure and bailing angle values to said computer;

(f) computing the weight of the loaded material by using said computer which bases its calculations on said fixed predetermined values and said measured pressure and bailing angle values; and

(g) providing an indication of the weight of said loaded material.

4,499,961

COMBINATORIAL WEIGHING APPARATUS WITH CHECK WEIGHER

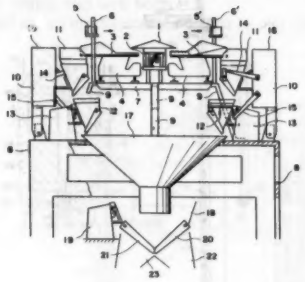
Masao Fukuda, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Jun. 21, 1983, Ser. No. 506,319

Claims priority, application Japan, Jun. 22, 1982, 57-93319[U]

Int. Cl.³ G01G *19/22, 19/52;* **B07C** *5/16*

U.S. Cl. 177—25 **8 Claims**



1. A combinatorial weighing apparatus for combining batches of articles having weight data from a plurality of weighing machines, finding a combination of weights giving a weight sum equal or closest to a target weight value within an allowable weight range setting, and discharging the batches of articles from the weighing machines providing the combination of weights, said combinatorial weighing apparatus comprising:

(a) a checking hopper for retaining the batches of articles discharged from the weighing machines providing the combination of weights; and

(b) a checking weighing machine, operatively connected to said checking hopper, for reweighing the batches of articles contained therein and providing reweighing data.

4,499,962

REMOVABLE HOPPER MECHANISM IN AN AUTOMATIC WEIGHING APPARATUS

Asashiro Izumi, Kusatsu, Japan, assignor to Kabushiki Kaisha Ishida Koko Seisakusho, Kyoto, Japan

Filed Sep. 20, 1982, Ser. No. 419,920

Claims priority, application Japan, Sep. 21, 1981, 56-140663[U]

Int. Cl.³ G01G *19/22, 21/28*

U.S. Cl. 177—58 **12 Claims**

1. A removable hopper mechanism for an automatic weighing apparatus having a dispersing table for supplying articles, a pool hopper for receiving articles from the dispersing table, a weighing hopper for receiving articles from said pool hopper and a weighing mechanism for weighing the articles received in said weighing hopper, comprising:

a frame;

a stand tiltably mounted on said frame;

a driver unit mounted on said stand;

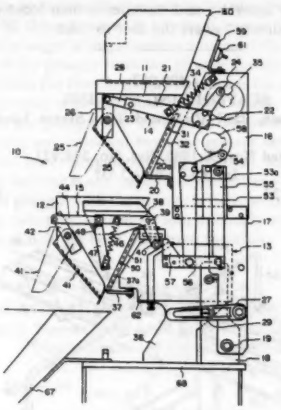
a support bracket attached to said driver unit;

said pool hopper having guide members removably engaging said support bracket, a bottom cover drivable by said driver unit and guide plates removably mounted on said driver unit for guiding articles as supplied from the dispersing table into said pool hopper;

a first lever mechanism by which said driver unit and said bottom cover of said pool hopper are operatively interconnected, said first lever mechanism comprising disengageable levers; and

a second lever mechanism by which said driver unit and said bottom cover of said weighing hopper are operatively

interconnected, said second lever mechanism comprising a first lever operatively coupled with said bottom cover and having a roller, and a second lever operatively coupled with said driver unit and having a presser for engaging said roller when the bottom cover is to be driven by said driver unit.



4,499,963

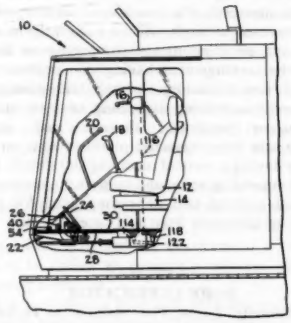
ADJUSTMENT MEANS FOR OPERATOR CONTROLS

Allen L. Liston, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 342,300, Jan. 25, 1982, abandoned. This application Jul. 11, 1984, Ser. No. 628,133

Int. Cl.³ B62D *25/20*

U.S. Cl. 180—90.6 **3 Claims**



1. In a crane having an engine, an operators cab with a floor, an engine control shaft, the angular position of which controls the engine's output, rotatably mounted on the underneath side of said floor, and a seat mounted on said floor for fore and aft movement, the improvement comprising:

a subfloor suspended below said floor for fore and aft movement relative thereto;

a pair of outboard pedals pivotally mounted on said subfloor for independent control of said engine;

a pair of levers affixed to each end of said engine control shaft;

a pair of flexible control cables, each of which is operatively connected to one of said outboard pedals and to one of said levers;

a pair of inboard brake pedals pivotally mounted on said subfloor;

a pair of independent master brake cylinders, each having a moveable spool, attached to said subfloor;

a pair of rods, each of which is operatively connected between one of said inboard brake pedals and the spool of one of said brake cylinders;

and means for selectively positioning said subfloor relative to said floor.

4,499,964

POWER STEERING SYSTEM

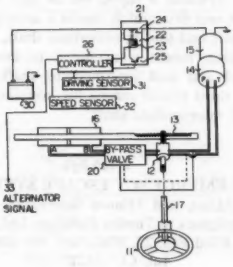
Michio Abe, and Naoyuki Maeda, both of Aichi, Japan, assignors to Tokai TRW & Co. Ltd., Aichi, Japan

Continuation-in-part of Ser. No. 221,612, Dec. 31, 1980, Pat. No. 4,392,540, and a continuation-in-part of Ser. No. 384,539, Jul. 20, 1981, Pat. No. 4,417,640. This application May 26, 1982, Ser. No. 382,362

Claims priority, application Japan, May 29, 1981, 56-82346

Int. Cl.³ B62D *5/06*

U.S. Cl. 180—142 **8 Claims**



1. An apparatus for use in operating a power steering motor and turning a steerable vehicle wheel, said apparatus comprising a pump, electric motor means for driving said pump to supply fluid to the power steering motor, and control means for varying the speed of operation of said electric motor means through a range of operating speeds, said control means including circuit means operable between a nonconducting state and a conducting state wherein electrical energy is supplied to said motor means and means responsive to vehicle speed for decreasing the speed of operation of said motor means through the range of operating speeds as vehicle speed increases by switching said circuit means between the conducting and nonconducting states to maintain said circuit means in the conducting state a percentage of the time which decreases through the range of motor operating speeds as vehicle speed increases during a steering operation.

4,499,965

HYBRID DRIVE ARRANGEMENT

Hermann Oetting, Brunswick, and Paulus Heidemeyer, Wolfsburg, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed May 13, 1982, Ser. No. 377,609

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1981, 3126487

Int. Cl.³ B60K *9/04*

U.S. Cl. 180—165 **5 Claims**

1. A hybrid drive arrangement for a vehicle, which comprises:

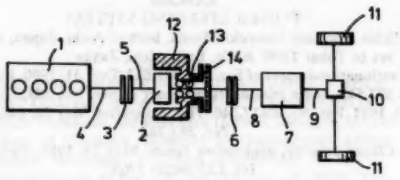
an engine having a crankshaft;

a flywheel storage drive means having a storage flywheel supported to rotate concentrically with the crankshaft, for storing kinetic energy particularly during vehicle braking conditions;

a transmission for driving drive wheels of a vehicle;

an engine flywheel for equalizing nonuniformities of engine output torque;

means for selectively coupling said engine and said storage flywheel to said transmission, the coupling means including first clutch means for coupling said crankshaft and said engine flywheel; and second clutch means for coupling said engine flywheel and said storage flywheel, wherein said transmission has an input shaft comprising an intermediate shaft carrying said engine flywheel, wherein said



storage flywheel is supported on said intermediate shaft, wherein said first clutch means is arranged to couple said crankshaft and said intermediate shaft, wherein said second clutch means is arranged to couple said storage flywheel and said intermediate shaft, and comprising further third clutch means for coupling said input shaft and said intermediate shaft.

4,499,966

EMERGENCY ESCAPE SYSTEM

William G. Milne, and Minoru Saruwatari, both of Calgary, Canada, assignors to Tundra Holdings Ltd., Calgary, Canada

Filed Feb. 22, 1983, Ser. No. 468,392
Int. Cl.³ A62B *1/20*
U.S. Cl. 182—3 **16 Claims**

1. A gravity operated emergency escape system for a multistory building comprising:

an elongate track vertically disposed and in a spaced relationship to a wall of the building, said track including an inside face facing the wall and an outside face facing away from the wall;

a rack disposed in the center of said outside face along the length of said track;

a traveller which moves along said track including a pinion which rotatably engages said rack, a pair of bearing members which engage opposite horizontal sides of said inside face, and a pivot means for each of said bearing members for pivoting each said bearing member horizontally clear of the respective side of said inside face as said pinion is brought into contact with said rack and for thereafter resiliently urging each said bearing member into bearing contact on the respective sides of said inside face after said pinion fully engages said rack such that said pinion is held in said rack;

a velocity control means operatively connected to said pinion for controlling the rotational speed thereof and hence the speed of said traveller relative to said track; and

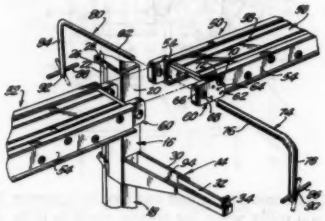
a harness connection means on said traveller for connecting a user received in a harness to said traveller during an emergency whereby said traveller is then located on the track and slowly lowers the user to safety.

4,499,967

SCAFFOLDING STAGING

Carl E. Anderson, 2581 Richmond Ter., Staten Island, N.Y. 10301

Filed Nov. 9, 1983, Ser. No. 549,922
Int. Cl.³ E04G *5/08*
U.S. Cl. 182—222 **8 Claims**



1. An interconnected scaffolding platform, comprising:

at least two elongated staging sections to be butted together;

a pair of end portions longitudinally projecting from the confronting ends of each section, each pair being staggered with respect to the other pair, so as to permit a mating interfit of the two pairs of end portions;

each of said end portions having a transverse bore therethrough, said bores being aligned in the interfit position of the end portions so as to define a passageway transverse to the sections, and

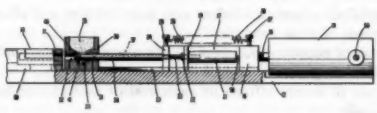
coupling means for extending through said passageway to securely interconnect said sections together, whereby the interconnected sections will lie colinearly in a common plane, said coupling means comprising an inverted U-shaped bar arrangement having one portion defining a bight portion extending through said passageway and other portions defining depending arms to retain the bar arrangement positioned through said passageway, wherein said interconnected platform rests on a support member having a vertical receiving slot therein for receiving said depending arms, and comprising locking means at the distal ends of said depending arms for preventing removal of said arms from said receiving slot.

4,499,968

BORE LUBRICATOR

Harry L. Zimmerly, Largo, Fla., assignor to Halkey-Roberts Corporation, St. Petersburg, Fla.

Filed Sep. 16, 1981, Ser. No. 302,777
Int. Cl.³ F01M *9/00*; F16N *7/14*
U.S. Cl. 184—18 **7 Claims**



1. Apparatus for lubricating a wall of a bore in an article, comprising an elongated plunger having an outer free end portion with an outer surface and a cross-section at least slightly smaller than that of the bore in the article, means for

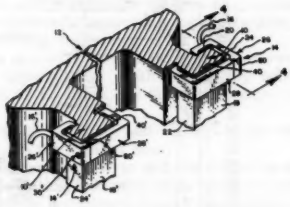
holding the article having the bore therein with the bore aligned with the plunger, means on the outer free end portion of the elongated plunger presenting an annular transverse groove in the outer surface thereof, means for introducing lubricant into the annular groove in the plunger so as substantially to fill the groove with lubricant, means for moving the elongated plunger along its axis so a to insert the outer free end portion of the plunger with the groove therein for containing lubricant into the bore in the article, means for axially narrowing the groove after said introduction of the outer free end portion of the plunger into the bore in the article so as to expel substantially any lubricant from the groove and to dispense it within the bore circumferentially thereof, and wherein the means for moving is also capable of thereafter withdrawing the elongated plunger with the groove in narrowed condition from the bore, whereby to spread longitudinally of the bore any lubricant which has been dispensed thereinto.

4,499,969

LUBRICATING OIL SALVAGING BLOCK ASSEMBLY

Chauncey E. Toombs, 8010 Lake Shore Rd., Angola, N.Y. 14006

Filed Apr. 25, 1983, Ser. No. 488,075
Int. Cl.³ B23B *45/00*; F16C *1/26*
U.S. Cl. 184—106 **6 Claims**



1. An assembly adapted for mounting on a vertically disposed machine way for purposes of collecting lubricating oil passing downwardly along vertically elongated guide surfaces thereof, said assembly comprising in combination:

a block having at least two sections of L-shaped plan view configurations defined by integrally formed first and second leg portions having inner surfaces cooperating to define a recess means sized and shaped to extend substantially throughout the transverse extent of said guide surfaces;

coupling means for clamping free ends of said first leg portions together thereby to couple said sections one to another and contiguous to said guide surfaces with said recess means arranged for cooperation with said guide surfaces to define an upwardly opening lubricating oil collecting reservoir;

means for providing a fluid seal between said sections and said guide surfaces substantially throughout the transverse extent thereof and relatively below said reservoir when said sections are contiguous to said guide surfaces; and

means providing for flow of lubricating oil collected in said reservoir remotely of said block.

4,499,970

WAYSIDE WHEELCHAIR LIFT

Ian G. Hussey, Oakland, Calif., assignor to Environmental Equipment Corporation, San Leandro, Calif.

Filed Jun. 25, 1982, Ser. No. 392,085
Int. Cl.³ B66B *9/20*
U.S. Cl. 187—9 R **3 Claims**

1. A lifting apparatus comprising:

a base support,

a support platform,

a first side support member attached to said base support adjacent one side of said support platform,

a second side support member attached to said base support adjacent the other side of said support platform,

means for raising and lowering said platform comprising

a first side lifting apparatus connected to said first side support member, said first side lifting apparatus comprising

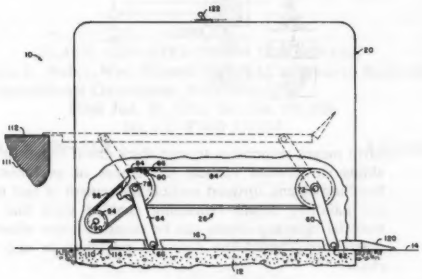
a pair of spaced apart first and second rotating actuating arms pivotally connected proximate their outer ends to one side of said support platform,

means for rotating said spaced apart first and second rotating actuating arms in unison,

a second lifting apparatus connected to said second side support and comprising

a pair of spaced apart third and fourth rotating actuating arms pivotally connected proximate their outer ends to the other side of said support platform,

means for rotating said spaced apart third and fourth rotating actuating arms in unison comprising



a first rotary motion actuator having a fixed housing and a rotor, said fixed housing connected to said first side support member,

a first drive wheel,

means for connecting said first drive wheel to said rotor of said first rotary motion actuator,

means for connecting said first rotary actuator arm to said rotor,

a first bearing connected to said first side support,

a second drive wheel having a shaft journalled to said first bearing,

means for connecting said second actuating arm to said shaft of said drive wheel, and

means for interconnecting said first drive wheel with said second drive wheel, and

means for interconnecting said first side lifting apparatus with said second side lifting apparatus for rotatating said first and second rotating actuating arms in unison with said third and fourth actuating arms.

4,499,971

MATERIAL HANDLING VEHICLE HAVING IMPROVED CHAIN MONITORING

Donald Luebrecht, Fort Jennings, and Kim A. Klopfleisch, St. Marys, both of Ohio, assignors to Crown Controls Corporation, New Bremen, Ohio

Filed Apr. 22, 1983, Ser. No. 487,533
Int. Cl.³ B66B *9/20*
U.S. Cl. 187—9 R **16 Claims**

1. In a material handling vehicle having a first mast assembly, material handling means suspended from and guided for vertical movement by said first mast assembly, first motor means, and at least a first chain, said first motor means and said first chain being coupled to said first mast assembly and said material handling means to effect vertical movement of said material handling means in response to movement of said first

means for biasing said adjusting sleeve away from said disc to cause a rearward end thereof remote from said disc to be maintained in contact with a forward end of said powershaft nut;

means for preventing rotation of said adjusting sleeve in said second direction including one-way clutch means between said adjusting sleeve and said housing which said one-way clutch means includes a clutch shaft mounted for rotation in said housing and being geared to circumferential gear teeth on said adjusting sleeve for rotation therewith and a helical spring clutch around said clutch shaft having an end anchored relative to said housing;

lost motion means between said powershaft and said adjusting sleeve, said lost motion means allowing rotation of said powershaft without corresponding rotation of said adjusting sleeve when said piston moves toward said disc less than said predetermined maximum distance and with corresponding rotation of said adjusting sleeve when said piston moves toward said disc in excess of said predetermined maximum distance; and

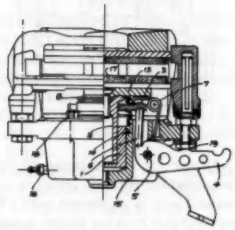
force limiting clutch means associated with said lost motion means preventing said corresponding rotation of said adjusting sleeve when said piston contacts said friction surface of said disc to provide a braking force thereto and when said powershaft rotates in said second direction.

4,499,977

INTEGRAL PARK BRAKE MECHANISM

Nui Wang, Punchbowl, Australia, assignor to Girlock Limited, Australia

Filed May 2, 1983, Ser. No. 490,588
Claims priority, application Australia, Aug. 25, 1982, PF5553
Int. Cl.³ F16D *55/26*
U.S. Cl. 188—72.6 **3 Claims**



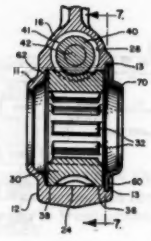
1. In a disc brake operating mechanism including an hydraulically operated piston in a cylinder arranged to move a friction pad into contact with a disc, the provision of a mechanically actuated brake operating mechanism consisting of a piston rod abutting the piston and being axially movable in relation thereto, an actuating collar having a bore surrounding the piston rod at a position outside said piston, a stop to support a part of the circumference of the actuating collar against movement towards the cylinder and means to apply an actuating force to a part of the collar diametrically opposed to the first mentioned part, the geometry of the actuating collar, the stop supporting the actuating collar, and the piston rod being such that on application of a force to said actuating collar by said means the actuating collar locks on the piston rod and moves the piston rod to effect application of the pad to the disc and such that on removal of said force frictional forces resisting the recovery of elastic strain in the system form a couple that unlocks the actuating collar from the piston rod whereby hydraulic operation of the brake can be effected independently of the parts of the mechanically actuated brake operating mechanism other than the piston rod.

4,499,978

SLACK ADJUSTER

Charles E. Norcross, Macomb, Ill., assignor to C. S. Norcross & Sons, Vernoa, Pa.

Continuation-in-part of Ser. No. 319,216, Nov. 9, 1981, abandoned. This application Apr. 7, 1983, Ser. No. 482,922
Int. Cl.³ F16D *65/46*
U.S. Cl. 188—79.5 K **25 Claims**



3. A manually adjustable brake slack adjuster comprising:

a slack adjuster body having a main portion provided with a central opening, an intermediate portion and a lever arm portion;

means provided on the lever arm portion for applying a braking force to the slack adjuster;

rotatable gear means positioned within said central opening to allow slack within a braking system to be adjusted;

cover means associated with said slack adjuster body and having an opening through which a brake shaft may be received; and

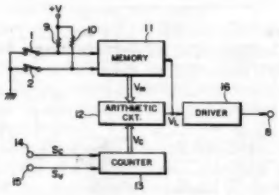
at least one of said cover means and said slack adjuster body being deformable to facilitate removably securing said cover means to said slack adjuster body.

4,499,979

LOCK-UP CONTROL SYSTEM FOR LOCK-UP TORQUE CONVERTER FOR LOCK-UP TYPE AUTOMATIC TRANSMISSION

Tadashi Suzuki; Yoshiro Morimoto; Hideo Hamada, all of Yokosuka; Masaaki Suga, Yokohama, and Masaaki Futagi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 5, 1981, Ser. No. 308,595
Claims priority, application Japan, Oct. 6, 1980, 55-138668
Int. Cl.³ B60K *41/22*
U.S. Cl. 192—3.31 **7 Claims**



1. A lock-up control system for a lock-up torque converter for a lock-up type automatic transmission for an automotive vehicle having an engine, the automatic transmission having at least two gear positions and having a lock-up control valve which is operable to cause the lock-up torque converter to lock up, said lock-up control system comprising:

means for generating a gear position signal indicative of one of the gear positions selected by the automatic transmission;

means for storing predetermined lock-up vehicle speed val-

ues versus at least the gear positions and for generating a signal indicative of a lock-up vehicle speed value versus the one gear position indicated by said gear position signal;

sensor means for generating sensor pulses having a frequency indicative of information related to the vehicle speed of the automotive vehicle;

clock means for generating clock pulses having a predetermined interval;

means responsive to one of said sensor pulses and said clock pulses for counting the other within a time interval between two adjacent pulses of said one pulses and for generating a vehicle speed signal indicative of the vehicle speed;

means for receiving said signal indicative of the lock-up vehicle speed value and said vehicle speed signal and for generating a lock-up signal when said vehicle speed signal has a predetermined relationship with said signal indicative of the said lock-up vehicle speed value; and

drive means for operating the lock-up control valve responsive to said lock-up command signal to cause the torque converter to lock up.

4,499,980

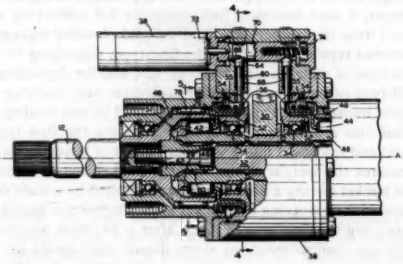
ACTUATOR FOR ROLLER CLUTCH DRIVE SYSTEM

David C. Kaminski, Sylvania, and Dennis W. Shea, Toledo, both of Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 30, 1982, Ser. No. 432,046

Int. Cl.³ F16D *27/10, 15/00*

U.S. Cl. 192—35 **2 Claims**



1. A two way overrunning roller clutch drive system including a case, two axles, and two pairs of complimentary drive and driven rotary members, each pair of rotary members sharing one of said axles, each said driven member including an axially extending bore, each said drive member having an end thereof disposed within said bore, each pair of said drive and driven members thus defining an axially extending annulus, each said pair further including a cage and a plurality of rollers positioned within said annulus, said cage disposed for maintaining said rollers in spaced relationship within said annulus, said cage further including a friction ring, wherein said drive system further includes an actuator ring in constant, resilient, frictional engagement with said friction ring, said actuator ring containing a plurality of circumferentially disposed garter springs thereabout, said overrunning clutch system further comprising means for positively locking said actuator ring to said case including a plurality of radially disposed detents uniformly spaced about said ring, said system further comprising a plunger supported in said case, said plunger extending radially inwardly toward said actuator ring and radially moveable into positive engagement with said ring, said plunger having first and second ends, said first end selectively moveable into one of said detents, said system further comprising a cam member also supported in said case, said cam member disposed for movement transversely to said second end of said plunger, said cam member including a cam surface engageable with said second end of said plunger, means for actuating said cam member to effect a positive engagement of said first end of said plunger with one of said detents, whereby engagement of said first end of said plunger with one of said detents frictionally energizes said actuator ring and said actuator ring is momentarily grounded to said case to effectuate lock-up of said rollers relative to said drive and driven members through said friction ring.

4,499,981

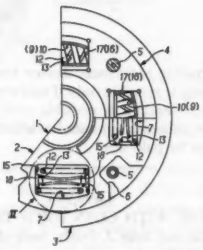
DAMPER DISC WITH CONCENTRIC SPRINGS INCLUDING HOURGLASS-SHAPED SPRINGS TO REDUCE THE EFFECT OF CENTRIFUGAL FORCES

Tamio Nagano, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Sep. 27, 1982, Ser. No. 424,177

Int. Cl.³ F16D *3/14, 13/68*

U.S. Cl. 192—106.2 **5 Claims**



1. A damper disc comprising:

a spline hub splined to an output shaft and having a radial flange;

a pair of annular side plates arranged at both sides of said flange and having a radially outer portion to which a torque is transmitted; and

torsion spring means arranged at openings in said flange and said side plates for connecting said side plates to said flange, at least some of said torsion spring means respectively consisting of coaxially arranged double compressible coil springs comprising a diametrically large and a diametrically small spring, each of said small springs being hourglass-shaped so that the diameter thereof gradually changes along the length and the axially middle portion thereof has the smallest diameter.

4,499,982

VEND POSSIBLE JUDGEMENT DEVICE FOR A VENDING MACHINE

Osamu Sugimoto, and Masaki Akagawa, both of Sakado, Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 359,163

Claims priority, application Japan, Mar. 24, 1981, 56-41658

Int. Cl.³ G07F *5/24*

U.S. Cl. 194—1 N **12 Claims**

1. A vend possible judgement device for a vending machine, comprising:

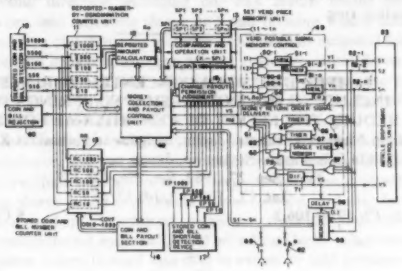
comparison means for comparing an amount of deposited coins and bills with at least one set vend price, and judging if vending is possible;

operation means for calculating the difference between said amount of deposited coins and bills and said set vend price, said difference being an amount to be paid out as change;

stored change counter means for establishing and maintaining a count of the numbers of coins and bills of each denomination stored for paying out as change; and

change payout permission judgement means for affirmatively judging that said amount to be paid out as change,

determined by said operation means, can be paid out when the numbers of stored coins and bills, established and maintained by said counter means are, by denominations or by combinations of denominations, sufficient to equal said amount to be paid out as change;



said vend possible judgement device rendering a judgement that vending is possible only if said comparison means has judged that vending is possible and said change payout permission judgement means has affirmatively judged that change can be paid out.

4,499,983

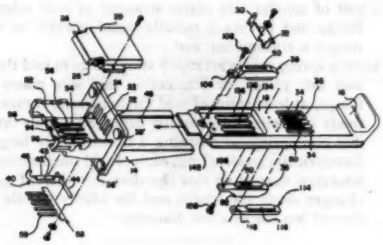
COIN SLIDE WITH COIN DROP DELAY MEANS

Harvey S. Gitlin, and John J. Duffy, both of 1723 Benjamin Dr., Ambler, Pa. 19002

Division of Ser. No. 348,172, Feb. 12, 1982, Pat. No. 4,401,202. This application Jul. 13, 1983, Ser. No. 513,368

Int. Cl.³ G07F *5/08*

U.S. Cl. 194—1 G **12 Claims**



1. A multiple coin slide of the type including a body adapted to be mounted to function a vending machine, a slide that is movable relative to the body between a coin receiving position and a vending position, the slide being provided with a plurality of coin openings for receiving a plurality of coins, the body including a mounting flange intermediate its forward and rearward ends, the flange being provided with a slide opening and a plurality of vertical openings, a lever checking mechanism secured within the body forwardly of the rearward body end, the lever checking mechanism comprising at least one pivotal lever with a hook adapted to limit rearward movement of the slide in the absence of a properly sized coin in a coin opening, a bridge overfitting the lever checking mechanism to urge the coins toward the lever checking mechanism as the slide is moved toward its said vending position, the improvement comprising

delay means rearwardly of the lever checking mechanism to delay the drop of some of the plurality of coins from the coin openings until after others of the coins have dropped from their associated coin openings,

the delay means comprising a non-linear rearward end, the coins being adapted to contact laterally spaced portions of the non-linear end as they drop from their respective coin openings.

4,499,984

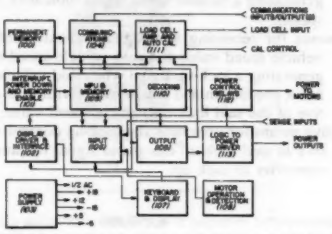
SELECTIVE SCRAP METAL COLLECTION APPARATUS

William J. Tuten, Scottsdale, and Kennith D. Crosby, Carefree, both of Ariz., assignors to Creative Technology Corp., Scottsdale, Ariz.

Filed Feb. 3, 1983, Ser. No. 463,573

Int. Cl.³ G07F *7/06*

U.S. Cl. 194—4 C **25 Claims**



1. In a collection apparatus for collecting scrap metal and for compensating depositors for a first type of metal as a function of the weight of the first type of metal deposited in a storage compartment of the apparatus, said apparatus having an input hopper, a start button, a first conveyor for conveying scrap metal from the hopper to a classifier, said classifier segregating a second type of metal from the first type, depositing the second type of metal in a metal receptacle and for depositing the first type of metal in a classifier conveyor, said classifier conveyor transporting the first type of metal to and loading said metal into a crusher, said crusher crushing the first type of metal and loading it into a weigher bucket of a weigher which measures the weight of the weigher bucket and its contents, said bucket having a door which is controlled by a scale dump solenoid for emptying the bucket after weighing, a stacker for conveying the first type of metal after it has been weighed to a storage compartment, an alarm display and means for producing motor alarms, second type metal alarms, classifier jam alarms and dispenser alarms, the improvement comprising:

a digital electronic controller responsive to a signal from the start button for energizing the first conveyor, the classifier, the crusher and the stacker, for calibrating the weigher, for weighing materials dumped in the bucket of the weigher, for monitoring the bucket to assure that the scale dump solenoid has opened the door thereto, for causing a reference voltage to be generated which represents a measure of exactly a given weight to be used in the weighing process, for dumping the materials from the hopper into the stacker for storage in the compartment, for dispensing compensation for the material weighed, and for stopping operation when there are is no more scrap metal to be processed;

a communication port for conveying and receiving remote information; and

front panel display means for indicating the weight of said first type of metal deposited.

4,499,985

VENDOR CHANGE RETURN CONTROL

James T. Schuller, St. Louis County, Mo., assignor to UMC Industries, Inc., Stamford, Conn.

Filed Sep. 24, 1982, Ser. No. 422,955

Int. Cl.³ G07F *5/24*

U.S. Cl. 194—10 **27 Claims**

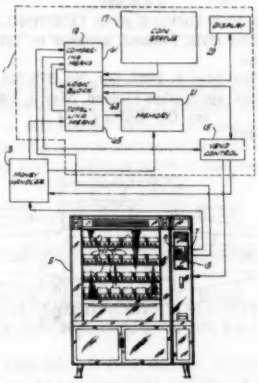
1. A change return control for a money handler in a vendor

capable of a plurality of customer selectable transactions at different prices, said money handler having means for identifying the denomination of items of money deposited in the vendor, means for storing coins for use as change and means for issuing coins from the storage means in change in different amounts, comprising:

means for determining if the coin storage means contains at least a first predetermined amount of change, and for determining if the coin storage means contains at least a second predetermined amount of change, said second predetermined amount being larger than said first amount;

a vend control for permitting a vend;

logic means for determining the amount of credit accumulated as a result of each deposit of money in the vendor, for comparing the price of a selected transaction with the accumulated credit, and for governing said vend control, said means allowing a vend requiring more than the first predetermined amount of change only if an item of money of a denomination greater than the amount of change required has been deposited in the vendor;



wherein the coin storage means includes a plurality of change tubes, wherein the amount of change determining means includes first sensing means for sensing the presence of the first predetermined amount of change and second sensing means for sensing the presence of the second predetermined amount of change;

wherein the first sensing means includes a first optoelectronic sensor assembly and the second sensing means includes a second optoelectronic sensor assembly; and

wherein the first predetermined amount of change is 95¢ and the second predetermined amount of change is $4.95, wherein the coin storage means includes a nickel change tube and a quarter change tube, wherein the first sensor assembly is disposed on the quarter change tube at a position where it senses if at least three quarters are present in the quarter change tube, and wherein the first sensing means also includes an optoelectronic sensor assembly disposed on the nickel change tube at a position where it senses if at least four nickels are present in the nickel change tube.

4,499,986

CONTROL APPARATUS FOR PASSENGER CONVEYOR

Nobuyoshi Tsuboi, Ibaraki; Seiya Shima, Katsuta; Morio Kanasaki, Katsuta, and Hayashi Nakazawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 351,767

Claims priority, application Japan, Feb. 27, 1981, 56-27038

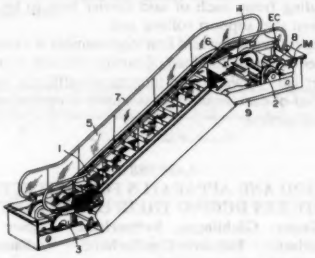
Int. Cl.³ B66B *9/00*; B65G *17/00*

U.S. Cl. 198—322 **8 Claims**

1. A control apparatus for a passenger conveyor which comprises step plates interlinked to one another in an endless form for transporting passengers thereon, and a three-phase induction motor for driving said step plates and capable of being changed over between star- and delta-connection modes, said control apparatus comprising:

transportation demand detecting means for detecting transportation demand for said passenger conveyor on the basis of electric power supplied to said three-phase motor;

means for setting a first predetermined value and a second



predetermined value smaller than said first predetermined value; and

change-over means for switching the winding connection of said induction motor into the delta-connection mode when the transportation demand exceeds said first predetermined value and for switching the winding connection of said induction motor into the star-connection mode when the transportation demand is below said second predetermined value.

4,499,987

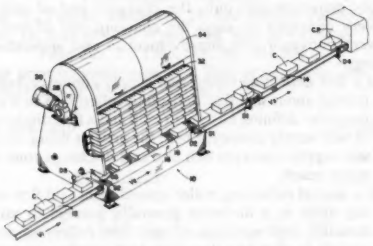
ACCUMULATOR FOR A CARTON FILLING AND PACKING PRODUCTION LINE

Charles P. Long, 216 Cleveland Ct., Mill Valley, Calif. 94941

Filed Aug. 30, 1982, Ser. No. 412,570

Int. Cl.³ B65G *37/00*

U.S. Cl. 198—347 **11 Claims**



1. An accumulator system for cartons moving along a conveyor line between first and second work stations comprising:

a generally horizontal conveyor section including a plurality of generally parallel, transverse support rollers of small diameter;

said section adapted to be interposed between an input conveyor moving at a first velocity from said first work station and an output conveyor moving at a greater velocity to said second work station;

said rollers being rotated to move cartons at an intermediate velocity along said section to said output conveyor;

a first stop member at the downstream end of said section movable when energized from a retracted position out of the path of cartons on said section to an extended position blocking movement of cartons thereon;

a jam detector positioned beyond the downstream end of said section and operative to generate a jam signal when cartons moving along said output conveyor are in abutment;

means operable in response to a jam signal to energize said first stop member;

a plurality horizontal rows of spaced, elongated carrier bars approximately coextensive with and adjacent said section;

a plurality of transverse lift fingers closely spaced along, and extending from, each of said carrier bars to be received between said support rollers; and

means operative when said first stop member is extended and said section has a full load of cartons thereon to move said carrier bars upwardly an increment sufficient to lift said full load of cartons clear of the path of carton movement on said section.

4,499,988

METHOD AND APPARATUS FOR DEFLECTING ARTICLES DURING THEIR CONVEYANCE

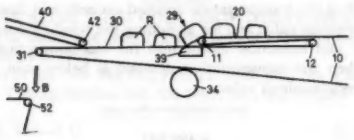
Markus Gasser, Gächlingen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 3, 1983, Ser. No. 491,239

Claims priority, application Switzerland, May 3, 1982, 2706/82

Int. Cl.³ B65G *47/46*

U.S. Cl. 198—369 **10 Claims**



1. In a conveyor assembly comprising an upper and a lower delivery conveyor each having a respective charging end, a supply conveyor belt carrying articles in a feed direction and having a discharge zone adjacent the charging ends of the upper and lower delivery conveyor, and an apparatus for selectively routing articles from the discharge zone of said supply conveyor belt onto the charging end of said upper delivery conveyor or onto the charging end of said lower delivery conveyor; the improvement in said apparatus comprising:

(a) a first deflecting roller; said supply conveyor belt being trained about said first deflecting roller; said first deflecting roller defining an upper reach and a first discharge end of said supply conveyor belt; the articles being carried by said supply conveyor belt into said discharge zone on said upper reach;

(b) a second deflecting roller spaced from said first deflecting roller in a direction generally parallel to said feed direction and upstream of said first deflecting roller as viewed in said feed direction; said supply conveyor belt being trained about said second deflecting roller from said first deflecting roller;

(c) first displaceable means supporting said first deflecting roller and movable, with said first deflecting roller, in a direction parallel to said feed direction, into advanced and withdrawn positions; in said advanced position of said first displaceable means said first deflecting roller being positioned in the immediate vicinity of said charging end of said upper delivery conveyor, whereby articles from said upper reach are transferred to said upper delivery conveyor; in said withdrawn position said first deflecting roller being situated upstream spaced from said charging end of said upper delivery conveyor, whereby articles from said upper reach are prevented from being transferred to said upper delivery conveyor;

(d) a third deflecting roller situated at a height level below that of said first deflecting roller; said supply conveyor belt being trained about said third deflecting roller from said second deflecting roller; said third deflecting roller defining a lower reach and a second discharge end of said supply conveyor belt; in said withdrawn position of said first displaceable means said first discharge end of said supply conveyor belt cooperating with said lower reach, whereby articles are transferred from said upper reach to said lower reach; and

(e) second displaceable means supporting said third deflecting roller and being swingable, with said third deflecting roller, into upper and lower positions; in said upper position said lower reach extending at least approximately parallel with said upper reach and in said lower position said third deflecting roller being positioned in the immediate vicinity of said charging end of said lower delivery conveyor, whereby articles advanced on said lower reach are transferred to said lower delivery conveyor.

4,499,989

METHOD AND DEVICE FOR TURNING A LONG

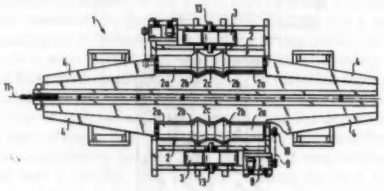
Erkki T. Lehtola, Böle, Finland, assignor to Tahka Oy, Kaskinen, Finland

Filed May 6, 1982, Ser. No. 375,748

Claims priority, application Finland, May 8, 1981, 811417

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—407 **1 Claim**



1. Apparatus for changing the direction of a generally horizontally traveling log moving in a longitudinal direction relative to its axis comprising: a pair of spaced-apart oppositely rotating rollers disposed in fixed locations with their axes permanently transverse to the direction of log travel, each of said rollers having two spaced-apart protruding conical portions defining between them a log-receiving depression having inclined sides which extend upwardly and outwardly toward the ends of the respective roller and each roller having end portions of uniform diameter; a pair of generally V-shaped blades one of which is located upstream of the pair of rollers and the other of which is located downstream of the pair of rollers, with regard to the direction of log travel; and means for rotating the blades in opposite directions about axes parallel to the direction of log travel, the arrangement of the blades being such that upon rotation in opposite directions they push horizontally on the log in opposite directions thereby swinging the log through a small arc whereupon the log becomes engaged with the end portions of the rollers and is further swung by the action of the rollers on the log.

4,499,990

APPARATUS FOR IMPARTING ANGULAR MOVEMENT TO ARTICLES WHILE BEING MOVED ALONG A PREDETERMINED PATH

Alton J. Fishback, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

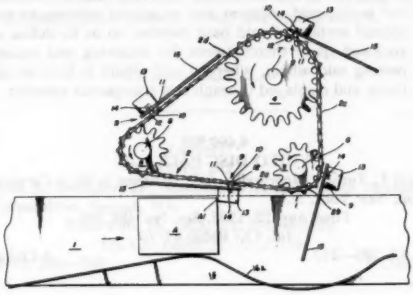
Filed May 3, 1983, Ser. No. 491,176

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—411 **13 Claims**

1. Apparatus for imparting angular movement to an article having substantially vertical angularly related sides while the article is being moved along a predetermined path, said appara-

tus comprising an endless element having a working reach movable alongside said predetermined path in angularly disposed converging relation thereto at a velocity somewhat less than the velocity of movement of the articles and having a curvilinear reach forming a continuation of the downstream



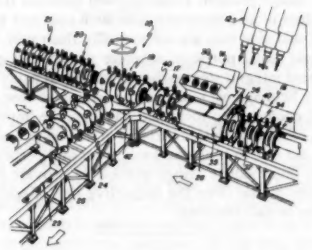
part of said working reach and extending in a direction away from said predetermined path, and at least one article engaging lug mounted on said endless element and engageable with an article for imparting angular movement thereto while said lug is moved along said curvilinear reach of said endless element.

4,499,991

AUTOMATED CONVEYOR SYSTEM

Dillis V. Allen, 1080 Nerge Rd., Suite 205, Elk Grove Village, Ill. 60007

Filed Mar. 5, 1979, Ser. No. 17,710
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—472 **5 Claims**



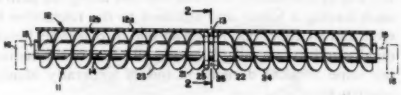
1. A conveyor system for conveying articles, comprising; a plurality of workholders movable in a predetermined path, means for moving said workholders including a plurality of separate drive sections, independent drive means for each of said drive sections, said drive sections having non-positive drive means engaging said workholders so that the workholders may move at different speeds than the drive means under a sufficient force, control means for selectively actuating said drive means to control said drive sections to slow or stop some of said workholders while continuing movement of other of said workholders, each of said drive sections including an elongated frame mounted for rotation about said predetermined path, a drive shaft extending through said frame, and clutch means for selectively connecting said drive shaft to said frame, said control means being connected to control said clutch.

4,499,992

SELF-CLEANING SUPPORT ROLLER FOR AN ENDLESS CONVEYOR BELT

Bernard S. Paulson, Clear Lake; Bruce H. Paulson, Clayton; Brian K. Clark, and Richard A. Briesemeister, both of Clear Lake, all of Wis., assignors to Pixall Corporation, Clear Lake, Wis.

Filed Apr. 18, 1983, Ser. No. 486,251
Int. Cl.³ B65G *45/00*
U.S. Cl. 198—498 **12 Claims**



11. A self-cleaning support roller for a conveyor belt, comprising:

shaft means having first and second ends and a longitudinal center, the shaft means being adapted to be rotatably mounted at each of said ends;

first flighting means on the shaft means for conveying material from a first point proximate the longitudinal central area of the shaft means toward said first end;

second flighting means on the shaft means for conveying material from a second point proximate the longitudinal central area of the shaft means toward said second end;

said first and second points being spaced apart;

a first annular member mounted at said first point in encircling relation to the shaft means, the first annular member defining an axial opening permitting material to pass therethrough to said first flighting means;

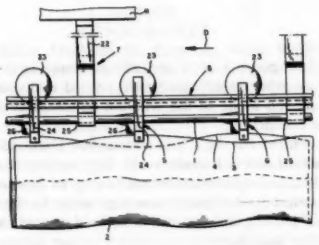
and a second annular member mounted at said second point in encircling relation to the shaft means, the second annular member defining an axial opening permitting material to pass therethrough to said second flighting means.

4,499,993

BELT-TYPE BULK-MATERIAL CONVEYOR FOR UNDERGROUND USE

Friedrich W. Paurat, Kasselweg 29, and Roland Paurat, Blumenstr. 11, both of 4230 Wesel, Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,534
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1982, 3202719; Apr. 15, 1982, 3213803
Int. Cl.³ B65G *15/08*
U.S. Cl. 198—819 **19 Claims**



1. A conveyor for transporting bulk material mainly underground along a closed path traversing at least one loading or unloading zone, the conveyor comprising:

a track on the path and including

a one-level main rail following the path outside the zone and having ends at the zone,

respective one-level Y-intersections at the zone each hav-

ing a central leg connected to the respective rail end and right and left arms extending into the zone, and

respective right and left rail branches at the zone extending from the right and left arms of the one Y-intersection to the right and left arms of the other intersection and spaced apart transversely of the path, the rail branches being of construction similar to the main rail;

an endless conveyor belt extending along the path and through the zone and having right and left longitudinal edges;

respective endless rows of longitudinally spaced right and left trucks alternating with one another along the path and each having a lower end attached to the respective belt edge and an upper end riding on and displaceable longitudinally in the main rail, the trucks all being of substantially the same vertical dimension and of generally identical construction;

an endless and flexible tension-transmitting drive element extending along the path and through the zone and connected at least indirectly to the belt and trucks;

drive means connected to the drive element for advancing the belt and trucks along the path in a transport direction; and

deflector means at, relative to the transport direction, the upstream Y-intersection for forcing the right trucks into its right arm and and thence into the right branch and for forcing the left trucks into its left arm and thence into the left branch, the belt being closed and tubular outside the zone when its right and left trucks are all in the main rail and being open in the zone when the right trucks are in the right branch and the left trucks are spaced therefrom in the left branch.

4,499,994

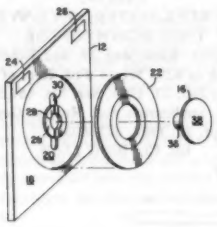
PHONOGRAPH RECORD AND ALBUM FRAME

Bruce W. Rentch, 7804 Byrds Nest Pass, Annandale, Va. 22003

Filed May 5, 1983, Ser. No. 491,811

Int. Cl.³ B65D *5/50*

U.S. Cl. 206—45.19 **15 Claims**



1. A phonograph record and album frame having a first mode of use wherein a phonograph record is displayed, and having a second mode of use wherein an album is displayed, said frame comprising:

a base member having a first surface and a second surface;

a cylindrical recess formed in the first surface of said base member, said cylindrical recess having an axis and having a predetermined diameter corresponding to the diameter of said phonograph record to be held in said cylindrical recess of said frame;

a through bore formed in said base member, said through bore having an axis which is coaxial with the axis of said cylindrical recess;

a holding member insertable into said through bore for retaining said phonograph record in said cylindrical recess;

a frame member cooperating with and releasably engageable with said base member; and

a transparent member engageably held by said frame member;

wherein, in said first mode of use, said transparent member is disposed adjacent and in spaced relation to said first surface of said base member, whereby said phonograph record is displayed through said transparent member; and

wherein, in said second mode of use, said transparent member is disposed adjacent and in spaced relation to said second surface of said base member so as to define an enclosed space therebetween for receiving and encompassing said album, whereby said album is held in said frame and displayed through said transparent member.

4,499,995

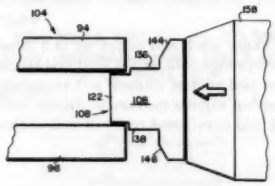
VIDEO DISC PACKAGE

Robert L. Turner, Mooresville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 25, 1983, Ser. No. 488,298

Int. Cl.³ B65D *85/30*

U.S. Cl. 206—312 **4 Claims**



1. A disc record package consisting of a substantially U-shaped, plastic enclosure, and a pair of plastic, T-cross sectioned side rails; said U-shaped enclosure comprising a pair of spaced panel portions interconnected by an end portion along one side of said panel portions; each of said side rails having an edge wall portion and an intermediate flange portion extending substantially perpendicularly from said edge wall portion to define a pair of channels; each of said side rails having an integral raised step portion in each channel thereof; said perpendicular flange portions being inserted between the respective side edges of said panel portions such that said edge wall portions of said side rails are substantially flush with said side edges of said panel portions; wherein plasticizing energy is applied to said integral step portions, while said panel portions are securely held against said flange portions, to fuse said side rails to said enclosure to form said package; the improvement comprising making the inside surfaces of said edge wall portion of each of said side rails extend away from said perpendicularly-disposed, intermediate flange portion to provide room for excess molten plastic from the respective one of said integral step portions in said channels.

4,499,996

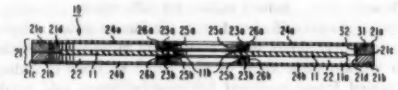
PROTECTIVE CARTRIDGE FOR DISC RECORD

Peter J. Coyle, Oakland, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,886

Int. Cl.³ B65D *85/57*; **G11B** *17/04, 23/02*

U.S. Cl. 206—444 **19 Claims**



1. An enclosure for a disc record comprising:

a first annular frame member having an inner surface defining the periphery of a cavity for said disc record;

a second annular frame member positioned coaxial and generally coplanar with said first annular member, with said second annular member adjacent a first surface of said disc record; and

a first membrane cover affixed to said first member and to said second annular member and maintained in tension therebetween, said first membrane cover defining one generally planar surface of said disc record cavity.

4,499,997

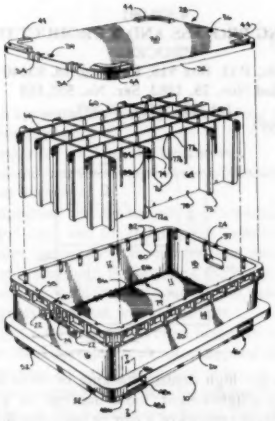
TOTE BOX

Harold E. Swingley, Jr., Monona, Wis., assignor to Menasha Corporation, Neenah, Wis.

Filed Feb. 24, 1983, Ser. No. 469,439

Int. Cl.³ B65D *21/02, 25/06*

U.S. Cl. 206—509 **9 Claims**



1. An improved tote box especially suited for use in an automated storage and retrieval system comprising:

a bottom;

opposing side and end walls each extending upwardly from said bottom;

a bumper rim located a distance up from said bottom which distance is substantially less than the total height of said side and end walls and extending outwardly from the exterior of each of said side and end walls so as to substantially circumscribe the periphery of said box; and

a plurality of stacking stops each including a horizontal top wall integrated with said bumper rim and extending outwardly from one of said side and end walls, a pair of generally vertical end walls each integrated to said top wall and each having a rearward edge integrated with said one of said side and end walls and a generally horizontal bottom wall integrated at each of its ends to a corresponding vertical end wall and integrated at its rearward edge to said one of said side and end walls to project horizontally therefrom, said bottom wall being spaced above the bottom of the tote box and providing a contact area for abutting the upper edge of a corresponding one of said opposing side and end walls of a like tote box when the boxes are stacked one on top of another, the portion of the box below the bottom walls of the stacking stops then being received in the lower box to limit relative horizontal movement.

4,499,998

FOOD CONTAINER WITH REMOVABLE LID

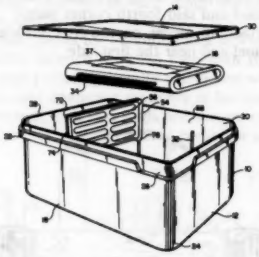
Arthur R. Carlson, East Malvern, Australia, assignor to Brian Davis and Company Proprietary Limited, Scoresby, Australia

Filed Mar. 18, 1983, Ser. No. 476,809

Claims priority, application Australia, Sep. 24, 1982, PF6048

Int. Cl.³ B65D *43/00*

U.S. Cl. 206—541 **3 Claims**



1. A container for food or the like comprising a base formed by a bottom wall and four perpendicular side walls of equal height joined to the bottom wall and to each other thereby creating an open-top enclosure; a rectangularly-shaped rim of constant height and width extending completely around the outer surfaces of said side walls at a line adjacent to but slightly below the top of said enclosure; at least one recess in said rim adjacent a junction of two side walls, said recess comprising a cut-away section of a substantial portion of the height of said rim extending from its top downwardly and extending from a point adjacent each side wall through the junction thereof; a detachable, flat lid having top and bottom surfaces; a rectangularly-shaped lip corresponding in width to the width of said rim extending downwardly from said bottom surface of said lid a distance equivalent to the distance at which the top of said rim is below the top of said enclosure, the bottom of said lip engaging the top of said rim except at the location of said recess when said lid is positioned on said base; at least one pair of inwardly projecting elongated lugs positioned on the inner surfaces of opposite side walls extending from points near the junctions of said side walls with said base upwardly towards the top of said enclosure, each of said lugs being provided with a slot extending substantially along its length; and a flat rectangularly-shaped divider detachably secured by two of its edges positioned in said slots thereby dividing said enclosure into horizontally disposed zones.

4,499,999

PICNIC BASKET

Marvin L. Behar, 316 Main St., Edmonds, Wash. 98020

Filed Jun. 30, 1983, Ser. No. 505,990

Int. Cl.³ A45C *11/20, 9/00*; B65D *81/36*

U.S. Cl. 206—546 **30 Claims**

1. An apparatus comprising:

a. a flexible, limber material;

b. said material having a first surface and a second surface;

c. said material having a first side and a second side;

d. said first side and said second side being, substantially, parallel;

e. said material having a first end and a second end;

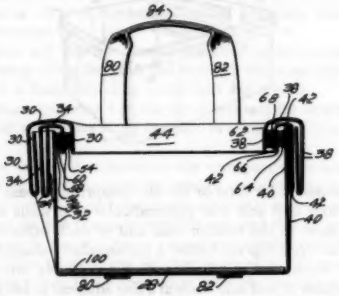
f. said first end and said second end being, substantially parallel;

g. said material may be considered as comprising nine panels;

h. said nine panels being a central panel, a first side panel, a first corner panel, a first end panel, a second corner panel, a second side panel, a third corner panel, a second end panel and a fourth corner panel;

i. said first end panel bordering said central panel;

j. said first end panel being between and bordering said first corner panel and said second corner panel;
k. said second side panel bordering said central panel;
l. said second side panel being positioned between said second corner panel and said third corner panel;
m. said second end panel bordering said central panel;
n. said second end panel being positioned between said third corner panel and said fourth corner panel;
o. said first side panel bordering said central panel;
p. said first side panel being positioned between said first corner panel and said fourth corner panel;
q. a first attaching means on the first surface of the first corner panel and near the first side;



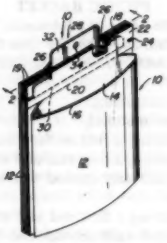
r. a second attaching means on the first surface of the first end panel and near the first end;
s. a third attaching means on the first surface of the second corner panel and near the second side;
t. a fourth attaching means on the second surface of the second corner panel and near the second side;
u. a fifth attaching means on the first surface of said third corner panel near the second edge;
v. a sixth attaching means on the first surface of the second end panel and near the second end;
w. a seventh attaching means on the first side of the fourth corner panel and near the first side; and,
x. an eighth attaching means on the second side of the fourth corner panel and near the first side.

4,500,000

PAD OF PLASTIC BAGS WITH SUPPORT MEANS

Hercules Membrino, 280 Paoli Pike, Malvern, Pa. 19355

Filed Mar. 12, 1984, Ser. No. 588,567
Int. Cl.³ B65D *85/62, 30/00*
U.S. Cl. 206—554 **10 Claims**



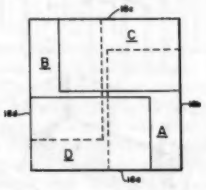
1. A pad of plastic open-mouthed pockets overlying each other and separably connected by a common base portion, said base portion being formed of selvage portions extending from the mouths of said pockets, said selvage portions having free edges in spaced parallel relation to the mouths of their respective pockets and side edges in common with the side edges of said pockets, said selvage portions being secured together by common side securing means at the side edges thereof and by common free edge securing means at the free edges thereof, a support hanger having a substantially longitudinal section and an extension projecting transversely therefrom, said longitudinal section being positioned to abut said free edge securing means to prevent movement thereof in a direction toward said free edges, said side edge securing means preventing lateral movement of said longitudinal section when it is so positioned, and said extension being positioned to by-pass said free edge securing means to project beyond said free edges when said longitudinal section is in abutment with said free edge securing means.

4,500,001

PALLETIZING PROCESS AND A PRODUCT OF THAT PROCESS

Frank J. Daniels, P.O. Box 518, Rexburg, Id. 83440

Filed Nov. 25, 1983, Ser. No. 555,164
Int. Cl.³ B65D *21/00*
U.S. Cl. 206—597 **11 Claims**



1. A process for high density stacking of three-cubic-foot bags containing a lightweight, loose material on a standard pallet where a layer consists of a pair or bags laid side by side to leave open areas therebetween and to the pallet sides consisting of

positioning a standard pallet within an arrangement for laterally supporting bags as they are stacked on said pallet;

positioning on that pallet, as a first layer, a pair of bags offset from and alongside one another leaving open areas therebetween with opposite bag corners aligning with opposite pallet corners;

positioning on that pallet, as a second layer, a pair of bags offset from and alongside one another and rotated ninety degrees (90°) from said first layer with opposite bag corners aligned with opposite pallet corners, portions of the bags of said second layer positioned over to fill in said open area between said bags and the pallet sides of said first layer;

positioning on that pallet, as subsequent layers to a desired stack height, pairs of bags offset from and laid alongside one another and each pair rotated ninety degrees (90°) from the layer below the opposite corners of the bags of each layer aligned with opposite pallet corners and filling in said open areas between said bags and the pallet sides of said layer below;

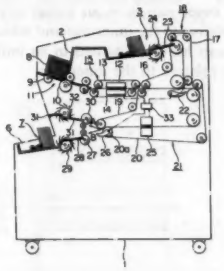
applying vertical pressure on each said bag in turn to force air out from the bag interior and to cause the materials therein to flow into open areas in the layer of bags below said bag; and

securing the stack of bags to the pallet.

4,500,002
APPARATUS FOR SORTING AND COUNTING A NUMBER OF BANKNOTES

Yoshihiro Koshio, Odawara; Tadao Kato, Ninomiya, and Hikaru Kawano, Odawara, all of Japan, assignors to Musashi Co., Ltd., Tokyo and Hitachi Engineering Kabushiki Kaisha, Kanagawa, both of, Japan

Filed Dec. 16, 1982, Ser. No. 450,194
Claims priority, application Japan, Dec. 21, 1981, 56-205140
Int. Cl.³ B07C 5/08
U.S. Cl. 209—534 **3 Claims**



1. An apparatus for sorting and counting a number of banknotes comprising;

a hopper for stacking the banknotes;

a feed-out unit for taking out the banknotes one by one from said hopper;

a judgement unit for identifying those banknotes in a damaged state and for judging the authenticity of the banknotes coming in from said feed-out unit;

a first branch unit for selecting the route to be followed by the banknotes from said judgement unit depending on the signals from said judgement unit;

a reject note stacker having a first vane wheel and adapted for stacking reject banknotes supplied through a first route specified by said first branch unit;

a front-reverse side checker for sensing the front and reverse sides of the banknotes supplied through a second route specified by said first branch unit;

a second branch unit for alternately selecting between two routes for the banknotes which have passed through said front-reverse side checker on the basis of respective front side and reverse side signals from said front-reverse side checker; and

a single, normal banknote stacker having a pair of vane wheels each provided in the respective of said two routes for banknotes that have passed through said front-reverse side checker, said vane wheels rotating in mutually opposite directions for stacking the notes from said second branch unit in said normal banknote stacker with their same sides facing in the same directions therein.

4,500,003
AXIAL LEAD TESTER/SORTER

Nicholas J. Cedrone, 10 Hawthorne Rd., Wellesley Hills, Mass. 02181

Filed May 20, 1982, Ser. No. 380,335
Int. Cl.³ B07C 5/344
U.S. Cl. 209—573 **9 Claims**

1. Apparatus for handling, testing and sorting axial lead electronic devices comprising:

an input bin that holds a supply of said devices,

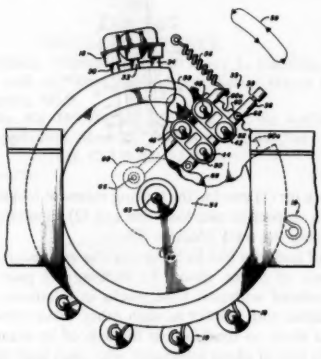
a rotating wheel carrier for the devices that includes means for attracting devices from said input bin and carrying them in a predetermined, circumferentially spaced array on the periphery of said wheel with the devices aligned with the axis of rotation of said wheel,

means for selectively stripping said devices from said wheel at at least one predetermined angular position of said wheel,

means for rotating said wheel,

at least one contactor assembly structured to make an electrical connection to at least one of said axial lead devices carried on said wheel when the device moves through a test zone intermediate said input bin and said stripping means, and

mechanical means for mounting and moving said contactor assembly through a closed loop path that includes (i) a first path portion generally coincident with said test zone where said contactor assembly is lowered into electrical connection with said leads and moves so that there is no relative motion between said contactor assembly and said



device carried on said wheel and (ii) a second path portion where said contactor assembly is raised from said devices and moves in a direction opposite to the direction of rotation of said wheel to a preselected re-entry point at the beginning of said test zone,

said mechanical means including (i) a flying arm assembly having a pivot arm mounted for pivotal movement at a lower end about an axis that is offset a distance from the axis of rotation of said wheel, (ii) a flying arm mounted on said pivot arm for movement along a line which is coincident with a radius of said wheel, and (iii) means for positively mechanically coupling said flying arm assembly to said wheel for said movement along said first path position when said contactor assembly is lowered into electrical connection with said leads,

said mechanical means being substantially free of mechanical collisions and vibrations that would detract from the accuracy of said testing.

4,500,004
TRANSPORT CARRIAGE

Penn A. Peters; Cleveland J. Biller, and David D. Johnson, all of Morgantown, W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

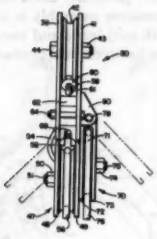
Filed Sep. 9, 1983, Ser. No. 530,829
Int. Cl.³ B66C 17/06
U.S. Cl. 212—80 **4 Claims**

1. A skyline logging system including a ground anchor, a crane having a vertically extending boom, a high line connected in tension to the anchor and the upper end of the boom, a carriage mounted to move along said high line, a plurality of load blocks pivotally mounted on said carrige below said high line and a separate load line means extending from each load block for supporting separate loads,

the carriage including a pair of spaced apart plates, means for securing the plates in relative position with a circular track block and a locking means mounted therebetween, said track block being free to rotate about its axis while engaging the high line and not engaging the locking means,

means secured to said high line for (1) preventing movement of said carriage away from said crane along said high line, (2) moving the locking means to locking position with respect to the track block and (3) simultaneously unlocking a first of said load blocks;

means secured to the load line extending from said first load



block for (1) moving the locking means to locking position with respect to said load line and (2) simultaneously unlocking the track block to rotate,

each of said load blocks being circular and secured between a pair of plates, means for holding the pairs of plates associated with said load blocks in relatively stationary position with respect to each other while allowing each load block to rotate about the axis of its circular shape, each pair of plates associated with each load block being pivotally secured to said carriage with the axis of rotation of said pivotal security being substantially parallel with the adjacent high line and substantially perpendicular to the axis of the associated circular shape.

4,500,005

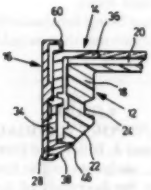
TAMPER-EVIDENT CAP ASSEMBLY FOR A CONTAINER

Jerry Forrester, 132 Greenwood Village, Sherwood Park, Alberta, Canada (T8A 0Z8)

Filed Mar. 12, 1984, Ser. No. 588,837

Int. Cl.³ B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—203 **8 Claims**



1. A tamper-evident cap assembly for a container with an externally screw-threaded top, the cap comprising:

an inner cap having an annular wall and an open lower end, said annular wall having an internal screw-thread to enable the inner cap to be screwed onto the top of the container by clockwise movement of the inner cap relative to the container,

an outer cap having an annular wall, a closed upper end and an open lower end, said outer cap being fitted over the inner cap, means retaining the outer cap in assembly with the inner cap,

the annular walls of the inner and outer caps having mutually-engaging screw-threads to cause initial anticlockwise turning movement of the outer cap to result in angular movement of the outer cap relative to the inner cap,

the inner and outer caps having cooperating ratchet means to cause clockwise movement of the outer cap to be transmitted to the inner cap while permitting anticlockwise movement of the outer cap relative to the inner cap, the closed end of the outer cap having a window and the inner cap having insignia which is not visible in the window when the outer cap is in an initial relatively clockwise position relative to the inner cap and which is visible when the outer cap has been turned in an initial anticlockwise movement relative to the inner cap.

4,500,006

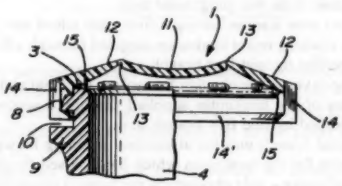
SAFETY CLOSURE CAP

Lucien Lafortune, 11510 Pasteur St., Montreal, Canada (H3M 2P2), and André Rouette, 12 du Vallon St., Saint-Sauveur-des-Monts, Canada (J0R 1R0)

Filed Apr. 30, 1984, Ser. No. 605,221

Int. Cl.³ B65D *55/02, 85/56;* **A61H** *1/00*

U.S. Cl. 215—224 **5 Claims**



1. In a container and a safety cap adapted to close the container in fluid-proof relationship, the combination comprising a rigid container having an open top with a horizontal flat rim; said rim joining at its outer edge with a downwardly and outwardly inclined slanted wall portion; at least one circular protuberance formed at the lower end of said slanted wall portion, at the upper portion of the container wall and defining a flat step, and at its underside, a flat annular plane having an outer corner; said safety cap having a deformable central area merging with an annular portion; the outer circumference of the latter being integrally formed with a vertical downwardly extending flange; said flange having an inwardly directed projection at its lower end adapted to releasably snap into locking engagement with said outer corner; said annular portion having a lower surface provided with a first circular ridge adapted to abut against said rim in the closed condition of said cap; and being further provided with a second continuous ridge radially outwardly-spaced from said first ridge and adapted to sealingly contact said slanted wall portion to provide a fluid-proof seal between said safety cap and said container.

4,500,007

PARROT-BEAKABLE FREESTANDING PLASTIC DRUM ASSEMBLAGE FOR HANDLING HEAVY MATERIALS

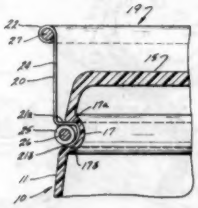
Andy J. Stoll, III, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 113,016, Jan. 18, 1980, abandoned, which is a continuation of Ser. No. 879,841, Feb. 22, 1978, Pat. No. 4,203,526, which is a continuation of Ser. No. 636,264, Nov. 28, 1975, abandoned, which is a continuation of Ser. No. 635,206, Nov. 25, 1975, abandoned. This application Dec. 4, 1980, Ser. No. 212,790

The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.

Int. Cl.³ B65D *1/46, 6/34, 25/22*

U.S. Cl. 220—71 2 Claims



1. A plastic drum assembly comprising a single-piece molded plastic drum having a top end, a bottom end, and a circumferential sidewall merging with said top and bottom ends, said sidewall including a circumferential recess adjacent said top end, said recess having an upper horizontal flat ledge portion facing downwardly and disposed essentially perpendicularly to the longitudinal axis of said drum, and a removable circumferentially disposed collar mounted on said drum, said collar having a substantially circumferential inwardly extending projection adjacent its lower margin positioned within and engaging said circumferential recess, said inwardly extending projection including a horizontal upper flat shoulder surface disposed in snug contact with said flat ledge of said recess, said collar being out of contact with said top end to allow access for drum chime-handling devices, said collar having an annular bead disposed adjacent the top thereof, whereby said collar is grippable by steel drum chime-handling devices enabling lifting and transportation of said drum assembly.

4,500,008

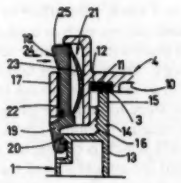
WEATHERPROOF AND/OR DUST PROOF FITTING

David L. Cook, Christchurch, New Zealand, assignor to PDL Industries Limited, Christchurch, New Zealand

Filed Sep. 22, 1982, Ser. No. 421,160

Int. Cl.³ H02G *3/14*

U.S. Cl. 220—242 16 Claims



1. A weatherproof and dust proof fitting cover comprising: a housing having a base attachable to a wall and similar surface; a bore in said base adapted to receive a fitting therein; a recess in said base surrounding said bore; a cover pivotally attached to the base for movement between an open and closed position and having a peripheral configuration substantially the same as said recess so that when in closed position it covers the bore; a resilient sealing means operatively disposed between said cover and recess to seal the bore when said cover is in the closed position; means to bias said cover toward its closed position wherein the inner surface of said cover and said sealing means cor tact each other; and latching means which automatically closes to releasably lock the cover in its closed position comprising a ledge protruding from the housing, a slot formed in the cover, a latching member mounted for toggle-like movement in said slot, a lip on said latching member cooperatively engageable with said ledge to lock said cover in said closed position, and a resilient biasing means operatively mounted in said slot to bias said latching member toward its locking position wherein said lip is engaged with the ledge of the housing and is disengageable from said ledge by pressing a part of said latching member against the force of said latch biasing means.

4,500,009

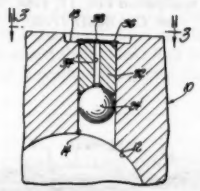
SEALED CONTAINER

Walter J. Rozmus, Traverse City, and Jerry L. Dietrich, Williamsburg, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Division of Ser. No. 399,932, Jul. 19, 1982, Pat. No. 4,478,788. This application Mar. 15, 1984, Ser. No. 589,768

Int. Cl.³ B65D *51/18*

U.S. Cl. 220—256 5 Claims



1. A sealed container (10) comprising an enclosed container (10) having a fill passageway (14) therein, a first sealing plug (24) disposed in sealing engagement with said fill passageway (14), a second sealing plug (32) disposed in sealing engagement with said passageway (14), said second plug (32) including a gas hole (34) therein for exiting gas between said plugs as said second plug (32) is inserted into said fill passageway (14).

4,500,010

WIDE-NECKED CONTAINER OF A SYNTHETIC RESIN WITH REMOVABLE LID

Udo Schütz, Am Rückersteg 4, D-5418 Selters, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 576,762

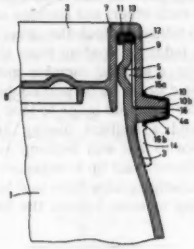
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 3305346

Int. Cl.³ B65D *45/32*

U.S. Cl. 220—320 6 Claims

1. Wide-necked barrel of a synthetic resin with a removable lid exhibiting a bottom entering into the barrel neck by way of an inner rim, and an outer rim extending over the barrel neck with a radial lid flange which is braced by means of a clamping ring against a closure element integrally molded to the barrel neck, a sealing ring inserted into the annular groove between the inner rim and the outer rim of the lid being urged against the top edge of the barrel neck, characterized in that the lid flange (10) exhibits on the underside alternatingly tongue-like extensions (14) and recesses (15) arranged with a specific pitch over the circumference of the lid; that radially outwardly oriented annular flange segments (4), molded on the barrel neck (3), engage into the flange recesses (15), these segments completing a partial cross-sectional profile (10*b*) of the lid flange (10), formed in the zone of the recesses (15), to a full

cross-sectional profile (10a) of the lid flange (10) in the zone of the extensions (14); and that the clamping ring (16) encompassing the lid flange (10) and the annular flange segments (4) is



secured by means of clamping ridges (17) integrally molded with the lid extensions (14) and extending in the circumferential direction.

4,500,011

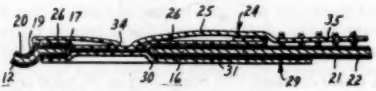
TAPE CLOSURE FOR A CAN END

Wilfred R. Brochman, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 458,564, Jan. 7, 1983, abandoned. This application Feb. 17, 1984, Ser. No. 580,752

Int. Cl.³ B65D *41/00*

U.S. Cl. 220—359 **12 Claims**



1. A container end assembly comprising:

a container end formed of metallic material having an exterior surface and an interior surface and being formed with a pour opening;

a first coating over said exterior surface of said end;

a second coating on said exterior surface over said first coating and bonded thereto, said second coating comprising a vinyl chloride/vinyl acetate copolymer;

a tape bonded by an adhesive to an area of the exterior surface of said second coating circumjacent and covering said pour opening, said adhesive forming a bond between said tape and said second coating which is greater than the bond between said second coating and said first coating whereby upon peeling of the tape from said container end said second coating delaminates in the area of the adhesive bond to said second coating, peeling said second coating from said first coating upon removal of the tape from the container end.

4,500,012

CAPSULE HANDLING APPARATUS

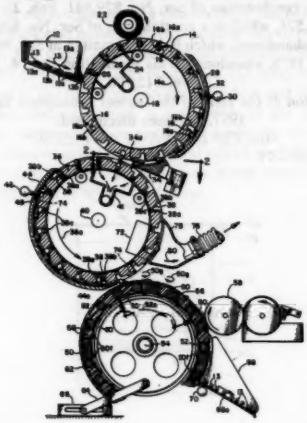
E. Michael Ackley, 1273 N. Church St., Moorestown, N.J. 08057

Filed Jun. 1, 1982, Ser. No. 383,691

Int. Cl.³ B65H *9/08*

U.S. Cl. 221—173 **43 Claims**

1. A carrier for handling an elongated article having two different diameter sections and an annular surface at the junction of said sections, said carrier having an elongated recess in a face thereof adapted to receive said article lengthwise along said face, said recess having first and second compartments separated by a wall disposed perpendicular to the longitudinal axis of said recess, said first compartment being at least as long



as the length of the larger diameter section of said article and said second compartment having a passage extending along said longitudinal axis of said recess to an outside surface of said carrier, said passage being at least as wide as the diameter of said larger diameter section of said article.

4,500,013

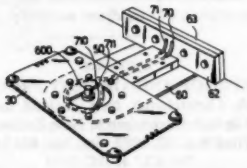
APPARATUS IN BANKS, POST OFFICES AND SIMILAR ESTABLISHMENTS FOR DISPENSING VALUABLE PAPERS

Leif Lundblad, Häradsvägen 102, S-141 41 Huddinge, Sweden

Filed Mar. 7, 1983, Ser. No. 473,031

Int. Cl.³ E05G *1/00*

U.S. Cl. 221—285 **18 Claims**



1. An apparatus in a bank, post office or like establishment for dispensing valuable papers such as banknotes, cheques etc., from a store of such papers to a customer receipt opening, said apparatus comprising a cabinet (10) for housing certain apparatus components, such as said store, means for conveying valuable papers from the store to said receipt opening, at least one keyboard, and said receipt opening, characterized by a base assembly (30-40-60-62) which is connected to the cabinet (10) and which is intended for attachment of the cabinet to a fixed wall or to the floor of a room in said establishment, said base assembly (30-40-60-62) comprising a support plate (30) having an abutment surface for the underside of the cabinet (10), a spacer or distance member (40) and a base plate (60-62) for direct attachment to said fixed wall or said floor, the support plate (30) and the underside of the cabinet (10) being designed to permit limited rotation of the cabinet (10) relative to the base assembly (30-40-60-62), said support plate (30), said distance

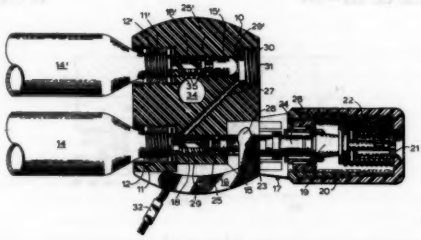
member (40) and said base plate (60-62) being so constructed that the support plate (30) can be firmly assembled to the distance member (40) and the base plate (60-62) in one of a plurality of distinct positions whereby the cabinet can be placed in a working position in one of a corresponding number of positions relative the base plate (60-62), thereby enabling the position of the cabinet relative to said base assembly to be adjusted in accordance with a selected position of the apparatus in the room in question.

4,500,014

MULTIPLE FIRING INFLATOR

Harry L. Zimmerly, Largo, Fla., assignor to Halkey-Roberts Corp., St. Petersburg, Fla.

Filed Dec. 14, 1982, Ser. No. 449,677
Int. Cl.³ B67B 7/24
U.S. Cl. 222—5 **7 Claims**



1. In an inflator adapted for use with gas-inflatable articles, said inflator having a body with means to discharge gas therefrom, means for holding a first gas capsule on the body, a first pin for piercing the first capsule, and means for advancing the first piercing pin and the first capsule relatively toward each other to pierce the first capsule, the improvement which comprises means on the body for holding a second gas capsule, a second pin for piercing the second capsule, and means including a cylinder having a piston therein for advancing the second piercing pin and the second capsule relatively toward each other to pierce the second capsule, first conduit means in the body for leading gas discharged from the first capsule to the cylinder to drive the piston therein in a second capsule piercing stroke, means in the body for combining the flows of gas from the first and second capsules, and second conduit means in the body for leading the combined gas flow from the first and second capsules to the gas discharge means on the body.

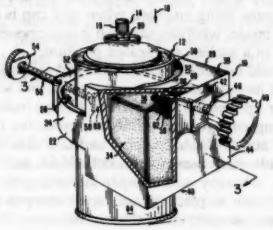
4,500,015

CAN PUNCTURING AND EMPTYING DEVICE

William H. Penney, 8775-20th St., Lot 475, Vero Beach, Fla. 32960

Filed May 24, 1982, Ser. No. 381,195
Int. Cl.³ B67B 7/24
U.S. Cl. 222—83.5 **11 Claims**

1. A can puncturing and emptying device comprising a frame, said frame including a band portion, said band portion having an opening configured to permit portions of a can to pass therethrough, said can having an exterior surface, means to clampingly engage said can to said frame, a threaded shaft, said threaded shaft threadingly engaged to said frame, one end of said threaded shaft having an elongated point-like shape, said threaded shaft having a longitudinal axis, said longitudinal axis of said threaded shaft being disposed at right angles to the surface of said can, means to advance and retract said end of said threaded shaft towards and away from a portion of said exterior surface of said can inwardly and outwardly from said opening, a mat, said mat comprising a cellular material for diffusing fluid issuing from a hole punctured in the can by the point-like end of the threaded shaft, said mat being compressed between said portion of said exterior surface of said can and said frame, a portion of said mat disposed surrounding said pointed end of said threaded shaft, whereby rotating said threaded shaft in a first direction engages said pointed end thereof with said portion of said exterior surface of said can and upon continued rotation pierces said portion of said exterior surface of said can forming a hole therein and whereby counter rotation of said threaded shaft positions said pointed end of said threaded shaft outwardly from said portion of said exterior surface of said can to permit the fluid contents of the



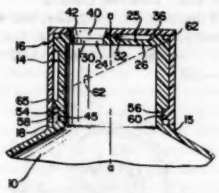
can to discharge through the hole and be diffused through said mat, said pointed end of said shaft being movable towards an exterior surface of said mat that is engaged with said portion of said can upon said threaded shaft being rotated in a first direction and being positioned passing through said exterior surfaces of said can and said mat upon said continued rotation of said threaded shaft a distance limited only by the amount of rotation of said threaded shaft in said first direction, whereby said hole in said can is positioned adjacent said exterior surface of said mat.

4,500,016

ROTATABLE CLOSURE AND DISPENSING DEVICE FOR COLLAPSIBLE TUBES AND/OR CONTAINERS

Horst Funfstuck, 364 W. Payson St., Glendora, Calif. 91740

Filed Dec. 16, 1982, Ser. No. 450,333
Int. Cl.³ B65D 35/48
U.S. Cl. 222—153 **4 Claims**



1. A rotatable closure and dispensing device for collapsible tubes and/or containers, comprising:
- a collapsible tube adapted to store various fluids or pastes therein;
- a nozzle integrally formed on said tube or container, and having a discharge port and a blank detent formed therein;
- a cap member rotatably mounted to said nozzle, said cap member having a discharge port formed therein for alignment with said discharge port of said nozzle;
- means formed on said nozzle and said cap member for selectively positioning said cap member on said nozzle;
- means for locking and sealing said cap member in an open or closed position;
- wherein said locking and sealing means comprises:
- said blank detent formed in said nozzle adjacent said nozzle-discharge port;
- a first depending annular lip member formed about said cap

discharge port, and adapted to be selectively positioned in said nozzle discharge port or said blank detent; and

a second depending annular lip member formed in said cap member adjacent said cap-discharge port, and adapted to be selectively positioned in said nozzle-discharge part or said blank detent;

an annular groove formed in said nozzle having a lower wall defining a nozzle-base member, and an upper wall formed having cam means at opposite sides thereof; and

a keeper member formed on said cap adapted to move within said groove and engage each cam means, either of said cam means being engaged when said cap is in an open or closed mode, whereby said cap is compressed against said nozzle in a locked and sealed position;

wherein said nozzle-discharge port and said blank detent are formed having inclined annular walls, and said depending annular lip members are formed having inclined walls for matching engagement with said respective inclined walls of said nozzle-discharge port and said detent;

tamper-indicating means formed between said cap and said nozzle, whereby said tamper-indicating means must be broken prior to placing said cap in an open position;

wherein said tamper-indicating means comprises:

a depending tongue member integrally formed along the lower edge of said cap member; and

a notch formed in said base member of said nozzle, and adapted to receive said tongue member when said cap is mounted to said nozzle; and

wherein said positioning means of said cap member on said nozzle comprises:

a cam deflector formed on said nozzle;

a pair of deflector-lug members formed on said nozzle; and

a positioning gap formed at the base of said cam deflector and above said notch in said nozzle base, said cam deflector and said deflector-lug members being positioned to guide said keeper member which is to be received and passed over said positioning gap, whereby said keeper member is positioned in said groove and said tongue member is received in said notch.

4,500,017

DISPENSING WHEEL AND SHAFT MOUNTING ARRANGEMENT THEREFOR

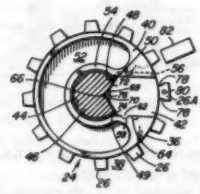
Cecil B. Machnee, Yorkton, Canada, assignor to Morris Rod-Weeder Co. Ltd., Yorkton, Canada

Filed Sep. 21, 1982, Ser. No. 420,775

Claims priority, application Canada, Jan. 29, 1982, 395203

Int. Cl.³ F16H *55/22*

U.S. Cl. 222—288 **21 Claims**



1. A dispensing wheel mountable on a shaft having a longitudinally extending V-shaped groove in the outer surface thereof and being rotatably mounted in an outlet of a dispensing apparatus, comprising: a generally C-shaped major part defining a major peripheral surface portion of said wheel and having a transverse shaft-receiving opening therethrough, the free edges of said major part being parallel and defining therebetween a slot extending from said opening to the outer periphery of said major part; and a minor part receivable in said slot, being lockingly engageable with said major part, and defining the remainder of the peripheral surface of said wheel when fully received in said slot, said minor part being provided with drive means in the form of a projection having converging edge surfaces matable with said V-shaped groove in said shaft, whereby said projection is automatically engageable with said groove when said minor part is fully received in said slot for providing a driving connection between said shaft and said dispensing wheel.

4,500,018

ROTARY SLIDING CLOSURE UNIT AND LIQUID MELT CONTAINER EMPLOYING THE SAME

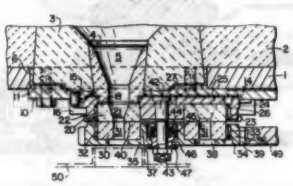
Robert Zaugg, Baar, and Werner Keller, Steinhausen, both of Switzerland, assignors to Stopinc Aktiengesellschaft, Baar, Switzerland

Filed Jul. 6, 1982, Ser. No. 395,304

Claims priority, application Switzerland, Jul. 15, 1981, 4631/81

Int. Cl.³ B22D *41/08*

U.S. Cl. 222—598 **10 Claims**



1. A rotary sliding closure unit for use with a liquid melt container of the type including an outer jacket, an inner refractory lining, and a pouring opening extending through the lining; said rotary sliding closure unit comprising:

a base plate adapted to be connected removably to the outer jacket of the liquid melt container;

a stationary support frame mounted removably on said base plate;

a stationary refractory plate having therethrough a flow passage, said stationary refractory plate being supported by said stationary support frame such that said flow passage is in communication with the pouring opening, said stationary refractory plate including a center opening and having an annular, ring-shaped configuration;

a rotary refractory plate positioned in sliding abutting contact with said stationary refractory plate and having therethrough a plurality of flow passages to be moved selectively into and out of alignment with said flow passage of said stationary refractory plate, said rotary refractory plate including a center opening and having an annular, ring-shaped configuration;

a rotary support frame supporting said rotary refractory plate against said stationary refractory plate for rotational movement with respect thereto;

said stationary and rotary refractory plates having complementary, annular, abutting relative sliding surfaces;

said stationary and rotary support frames comprising respective disc-shaped members having hubs extending into respective said center openings; and

means, fixed to one of said support frames and without direct connection to said base plate, for coaxially aligning said stationary and rotary support frames and said stationary and rotary refractory plates, and for urging said rotary refractory plate toward said stationary refractory plate, said means comprising a bolt fixed in said hub of said stationary support frame and extending through said hub of said rotary support frame, a guide sleeve surrounding said bolt within a bore hole in said hub of said rotary support frame, and spring means acting between said

guide sleeve and said rotary support frame for moving said rotary support frame away from said guide sleeve.

4,500,019

CARRIER FOR PORTABLE AUDIO DEVICES

John J. Curley, Jr., P.O. Box 206, Pleasant St., Dunstable, Mass. 01827

Filed Jun. 23, 1983, Ser. No. 507,284
Int. Cl.³ A45C *11/00*
U.S. Cl. 224—222 **17 Claims**

1. A carrier apparatus for portable audio devices comprising:

an armband portion longitudinally wrappable about a human upper arm and having an upper section which includes means defining a first inflatable chamber, a lower section which includes means defining a second inflatable chamber and an intermediate section which interconnects said upper and lower sections and is thin relative to said upper and lower chambers when said chambers are inflated, said armband portion further including port means for introducing a fluid into said chambers to thereby inflate said chambers into a condition wherein said armband is laterally contoured to substantially conform to the muscular contour of said upper arm and thereby maintains a substantially fixed position along the length of said arm; and

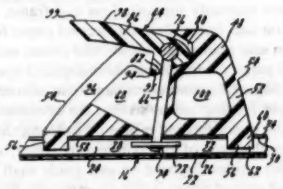
means attached to said armband portion of holding a portable audio device.

4,500,020

ARTICLE CARRIER WITH ADJUSTABLY POSITIONABLE BRACKET

William Rasor, Marysville, Mich., assignor to Masco Corp., Taylor, Mich.

Filed May 6, 1982, Ser. No. 375,399
Int. Cl.³ B60R *9/04*
U.S. Cl. 224—321 **8 Claims**



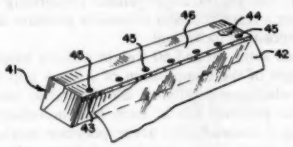
1. An article carrier for mounting on a surface of a motor vehicle, said article carrier comprising two tracks fixedly secured to said surface in a spaced apart parallel relationship, a longitudinal rib extending from each track, two brackets slidably secured to each of said tracks, two rails, each of said rails extending transversely between one of said brackets on one of said tracks and one of said brackets on the other of said tracks, said rails being fastened to said brackets such as to be supported above said surface, a resilient clamping plate disposed adjacent to said rib, a pin fastened to said plate, said pin having at its end furthest from said clamping plate a cylindrical member joined at right angles to said pin, a toggle arm having a linear passageway to pivotably mount said cylindrical member, and said pin passing through said toggle arm from said cylindrical member to said clamping plate, said toggle arm having a camming extension on a surface thereof in contact with the surface of said bracket whereby as said toggle arm is pivoted, said camming extension causes said toggle arm to draw said pin and urge said plate against said rib thereby clamping said rib between said plate and said bracket to fixedly secure said bracket to said rib.

4,500,021

RESEALABLE ARTICLES AND PROCESS

Leon L. Bildusas, 62 Hampton Rd., Aurora, Ill. 60538, assignor to Eschem Inc., Downers Grove, Ill.

Continuation-in-part of Ser. No. 220,116, Dec. 24, 1980, Pat. No. 4,399,249. This application May 26, 1983, Ser. No. 498,255
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.³ B32B *3/06*; B26F *3/02*
U.S. Cl. 225—49 **17 Claims**



1. A storage bag having a releasable and resealable resealing means, said storage bag having opposing film panels, said resealing means being near one edge of one of said panels, an opening located at said one edge, said bag having a closed condition at which said resealing means seals said panels together and closes said opening, said bag having an open condition at which said panels are separated at said opening, said bag being resealable from said open condition to said closed condition and being releasable from said closed condition to said open condition, the improvement comprising said resealing means being an area of resealable and releasable pressure sensitive adhesive composition including:

between about 20 and 60 weight percent based on the total weight of the composition of a block copolymer having non-elastomeric polymer blocks and at least one elastomeric polymer block, each said non-elastomeric block being a monoalkenyl arene polymer block, said elastomeric block being a conjugated diene polymer block;

between about 5 and 50 weight percent based on the total weight of the composition of an end block modifying resin that includes a monoalkenyl arene, said end block modifying resin being compatible predominantly with the non-elastomeric block and substantially incompatible with the elastomeric block;

between about 20 and 60 weight percent based on the total weight of the composition of a plasticizing process oil that is compatible predominantly with said elastomeric block and generally incompatible with the non-elastomeric block of the block copolymer; and

not more than about 14 weight percent, based on the total weight of the composition, of a mid block modifying resin that is compatible predominantly with the elastomeric block and substantially incompatible with the non-elastomeric block of the block copolymer.

14. A pad of peelable sheets, each said sheet having a back face and a resealing area located on each of said back faces of the peelable sheets, the improvement comprising said resealing

area being a resealable and releasable pressure sensitive adhesive composition including:

between about 20 and 60 weight percent based on the total weight of the composition of a block copolymer having non-elastomeric polymer blocks and at least one elastomeric polymer block, each said non-elastomeric block being a monoalkenyl arene polymer block, said elastomeric block being a conjugated diene polymer block;

between about 5 and 50 weight percent based on the total weight of the composition of an end block modifying resin that includes a monoalkenyl arene, said end block modifying resin being compatible predominantly with the non-elastomeric block and substantially incompatible with the elastomeric block;

between about 20 and 60 weight percent based on the total weight of the composition of a plasticizing process oil that is compatible predominantly with said elastomeric block and generally incompatible with the non-elastomeric block of the block copolymer; and

not more than about 14 weight percent, based on the total weight of the composition, of a mid block modifying resin that is compatible predominantly with the elastomeric block and substantially incompatible with the non-elastomeric block of the block copolymer.

15. A dispenser having a roll of wrapping film therewithin and a resealing area located on said dispenser at a position at which the resealing area adheres a leading portion of the wrapping film thereto, the improvement comprising said resealing area being a resealable and releasable pressure sensitive adhesive composition including:

between about 20 and 60 weight percent based on the total weight of the composition of a block copolymer having non-elastomeric polymer blocks and at least one elastomeric polymer block, each said non-elastomeric block being a monoalkenyl arene polymer block, said elastomeric block being a conjugated diene polymer block;

between about 5 and 50 weight percent based on the total weight of the composition of an end block modifying resin that includes a monoalkenyl arene, said end block modifying resin being compatible predominantly with the non-elastomeric block and substantially incompatible with the elastomeric block;

between about 20 and 60 weight percent based on the total weight of the composition of a plasticizing process oil that is compatible predominantly with said elastomeric block and generally incompatible with the non-elastomeric block of the block copolymer; and

not more than about 14 weight percent, based on the total weight of the composition, of a mid block modifying resin that is compatible predominantly with the elastomeric block and substantially incompatible with the non-elastomeric block of the block copolymer.

4,500,022

DEVICE FOR SEVERING BLANKS OF A BATCH OF DIE CUT SHEETS

Raymond Lucas, Prechac, France, assignor to Bobst SA, Lausanne, Switzerland

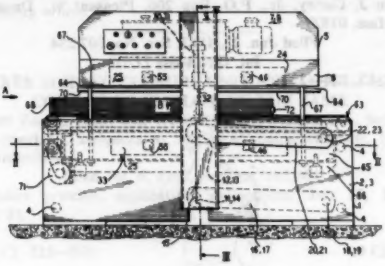
Filed May 18, 1983, Ser. No. 495,582

Claims priority, application Switzerland, May 19, 1982, 3143/82

Int. Cl.³ B26F *3/02*

U.S. Cl. 225—97 **9 Claims**

1. A device for severing various blanks of a batch of die cut sheets, said device comprising a lower frame having side frame members interconnected by a lower transverse plate, a movable upper frame having an upper transverse plate interconnecting a side frame, means forming an articulate parallelogram for interconnecting the movable upper frame and guiding it during movement relative to the lower frame, means for raising and lowering the upper frame relative to the lower frame, said transverse lower plate supporting a fixed plate and a slidable plate, said transverse upper plate supporting a fixed plate aligned with the lower fixed plate and an upper slidable plate, each of said upper and lower fixed plates and slidable plates supporting movable tables arranged in pairs, means for moving the movable tables in a direction transverse to the axis of the frame, means for moving the slidable plates longitudi-



nally in the frames and a conveyor disposed in the lower frame for transporting a stack in longitudinal direction of the device to be gripped between the movable tables as the upper frame is lowered onto the lower frame.

4,500,023

PAPER FEEDING APPARATUS FOR PRINTERS

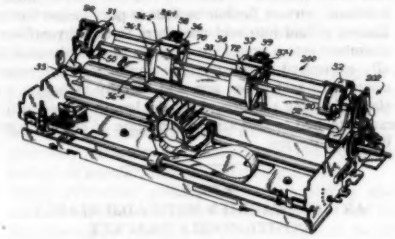
Hiroyuki Akazawa, Shiojiri, Japan, assignor to Epson Corporation and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,269

Claims priority, application Japan, Aug. 20, 1981, 56-123806[U]

Int. Cl.³ B65H *17/40*; B41J *11/28, 11/34, 13/14*

U.S. Cl. 226—76 **12 Claims**

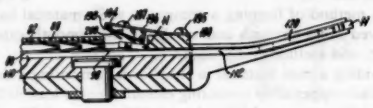


1. A paper feeding apparatus for use in a printer for feeding both a continuous paper having holes along the peripheral edges thereof and a single sheet of paper comprising a frame, platen means rotatably supported on said frame, a guide shaft supported on said frame, first and second paper feeding means disposed on said guide shaft above said platen means, said first and second paper feeding means being spaced apart so that the peripheral edges of a continuous paper can contact the first and second paper feeding means so that the continuous paper can be fed by the paper feeding means by utilizing the holes along the peripheral edges of the continuous paper, and first and second paper guides disposed on said guide shaft intermediate said first and second paper feeding means, said first and second paper guides having a first portion for guiding a continuous paper fed by the first and second paper feeding means, a second portion for guiding a single sheet of paper therethrough not fed by said first and second paper feeding means while being fed into said printer and a third guide portion for guiding the single sheet of paper therebetween after having traveled beyond said platen means.

4,500,024
MULTIPLE CLIP APPLIER

John DiGiovanni, Irvington, and Donald M. Golden, Cherry Hill, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 208,368, Nov. 19, 1980, Pat. No. 4,430,997.
This application Jun. 9, 1983, Ser. No. 502,855
Int. Cl.³ A61B 17/32, 17/12
U.S. Cl. 227—19 8 Claims



1. A disposable cartridge for a plurality of ligating clips comprising:

an elongated, generally U-shaped housing having a discharge end and having a transverse base defining a first plane and having two upstanding sidewalls;

a thin, generally planar, longitudinally-extending fixed rack secured in said first plane in said housing;

a thin, generally planar, longitudinally-extending movable rack mounted in said housing in a second plane generally parallel to said first plane of said first rack, with said planar surface of said movable rack disposed in confronting relationship to said planar surface of said fixed rack, each of said racks including a plurality of sets of resilient fingers projecting from its respective confronting planar surface toward the confronting planar surface of the other rack;

a plurality of clips arrayed in a line between the confronting planar surfaces of said racks from a first position adjacent the discharge end of said housing to successive positions placed longitudinally along said racks;

said movable rack advancing clips to said first position;

delivery means having a discharge end and movable in said housing in a third plane generally parallel to said first and said second planes;

long stroke motion receiving means on said delivery means;

short stroke motion receiving means on said movable racks;

said long stroke motion receiving means unconnected to said short stroke motion receiving means;

resilient transfer means cooperating with said delivery means and biased, in a rest position, in alignment with said movable rack and adapted for deflection transversely to said movable rack by said clip as said clip is advanced toward the discharge end of said housing;

said transfer means cooperating with said delivery means and said movable rack to transfer clips from said first position in said first plane of said fixed rack to said second plane of said movable rack and then to further transfer said clip from said second plane of said movable rack to said third plane of said delivery means.

4,500,025
BONE STAPLER

Edward P. Skwor, Burnsville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 18, 1983, Ser. No. 514,929
Int. Cl.³ A61B 17/04
U.S. Cl. 227—19 1 Claim

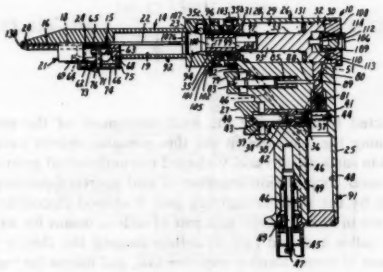
1. A bone stapler adapted for use with generally U-shaped staples each comprising a central portion and two generally parallel leg portions projecting generally in the same direction from opposite ends of its central portion and having distal ends, said stapler comprising:

a housing having a passageway extending from an inlet opening to an outlet opening, said passageway being adapted to guide a single staple moved from the inlet to the outlet opening with the distal ends of its legs leading;

means for biasing a stack of staples into said inlet opening;

a driver having an end portion adapted to engage the central portion of a said staple and being mounted on said housing for sliding movement between a load position with the driver spaced from the inlet opening to afford movement of one of the staples into the passageway, along said passageway through an intermediate position with said end portion pushing the staple, to an eject position at which the end portion of the plunger pushes the staple out said outlet opening and at which eject position the driver is stopped by said housing, said driver having a length along said passageway so that a portion thereof will be positioned adjacent said inlet opening during movement of said ram from said intermediate to said eject position to prevent movement of a second staple in said stack into said passageway through said inlet opening; and

drive means adapted to be manually activatable for rapidly and forcefully propelling said driver along said passageway toward said eject position and for subsequently biasing said driver for movement from said eject position back to said load position;



said housing and driver both comprising first and second parts, said first part of said housing defining said inlet and outlet openings and carrying said means for biasing, and said second part of said housing carrying said drive means; and

said stapler including manually operable engagement means adapted for releasable engagement to afford using first parts adapted for staples of different sizes with said second part, said engagement means comprising one of said parts of said driver having walls defining a socket and the other of said parts of said driver having a tip portion adapted to be inserted in said socket when said parts of said driver are rotated out of alignment and to engage within said walls when said parts of said driver are rotated into alignment; said parts of said housing being adapted to be relatively rotated to afford engagement of said driver parts, and means adapted for releasably latching said parts of said housing together in proper alignment.

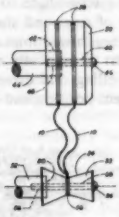
4,500,026
AUTOMATIC BELLOWS WELDER AND METHOD FOR USING SAME

Richard R. Larsen, Daytona Beach, Fla., assignor to Pacific Scientific Company, Anaheim, Calif.

Filed Oct. 21, 1981, Ser. No. 313,283
Int. Cl.³ B23K 37/04
U.S. Cl. 228—44.1 R 7 Claims

1. A device for welding thin metallic objects each having an aperture therein comprising a pair of rollers positioned in a spaced apart relationship, each roller in said pair of rollers having a circumferential groove formed in the outer surface thereof to receive the surfaces defining the apertures in the thin metallic objects to be welded, said circumferential groove in each roller of said pair of rollers being located approximately

in the center portion thereof and having a V-shaped axial cross-section, said center portion being of a smaller diameter than the end portions of each roller of said pair of rollers resulting in the formation of lead-in surfaces to said V-shaped circumferential groove in each roller of said pair of rollers, a roller located in proximity to said pair of rollers and having a plurality of circumferential grooves formed in the outer surface thereof, one or more of said plurality of circumferential grooves in said outer surface of said roller receiving the outer surfaces of the thin metallic objects to be welded, means for applying a radially directed force by said roller to the outer surfaces of the thin metallic objects to be welded, said radially



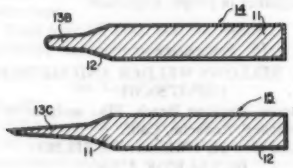
directed force causing the axial movement of the surfaces defining the apertures in the thin metallic objects over said lead-in surfaces into said V-shaped circumferential groove and the axial compression together of said aperture defining surfaces by the surfaces defining said V-shaped circumferential groove in each roller of said pair of rollers, means for rotating said roller and said pair of rollers causing the thin metallic objects to rotate about a common axis, and means for welding the surfaces defining the apertures in the thin metallic objects as they are compressed axially together and caused to rotate by rotation of said roller and said pair of rollers, said welding means being located between said pair of rollers.

4,500,027

METHOD OF MANUFACTURING SOLDERING TIPS

Masahiko Nakajima, Tokyo, Japan, assignor to Nakajima Dokosho Company Limited, Tokyo, Japan

Filed Nov. 2, 1982, Ser. No. 438,706
Claims priority, application Japan, Nov. 9, 1981, 56-179263
Int. Cl.³ B26K *3/02*
U.S. Cl. 228—54 **8 Claims**



1. A method of manufacturing a soldering tip, which comprises:

plating the outer surface of a copper substrate having a rounded top end with an iron layer to form a tip blank, and subsequently, shaping said tip blank under pressure into a desired final tip configuration.

4,500,028

METHOD OF FORMING A COMPOSITE MATERIAL HAVING IMPROVED BOND STRENGTH

John F. Breedis, Trumbull, and Julius C. Fister, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 392,999, Jun. 28, 1982, Pat. No. 4,429,022.
This application Oct. 28, 1983, Ser. No. 546,665
Int. Cl.³ B23K *20/04*
U.S. Cl. 228—117 **8 Claims**

1. A method of forming a composite sheet material having improved bond strength and a substantially smooth external surface, said method comprising:

providing a core material in strip form comprising a deoxidized copper alloy consisting essentially of at least 95% by weight copper and from about 0.05% to about 0.5% zirconium;

providing a cladding material in strip form comprising a dissimilar copper alloy;

rolling together said core and cladding materials in a single pass with a reduction of about 50% to 75% to form a metallurgical bond between said core and cladding materials; and

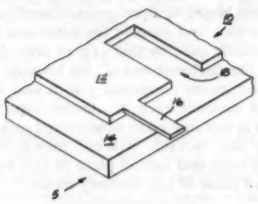
heating said bonded core and cladding materials to a temperature in the range of about 200° C. to about 750° C. for a time period of about 5 minutes to about 24 hours to increase the bond strength of said composite material.

4,500,029

ELECTRICAL ASSEMBLY INCLUDING A CONDUCTOR PATTERN BONDED TO A NON-METALLIC SUBSTRATE AND METHOD OF FABRICATING SUCH ASSEMBLY

Alexander J. Yerman, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 11, 1982, Ser. No. 387,717
Int. Cl.³ H05K *3/06*
U.S. Cl. 228—123 **10 Claims**



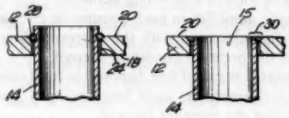
1. A method of fabricating an assembly including a conductor pattern bonded to a non-metallic substrate, wherein the method includes bonding a patterned metallic sheet to the substrate by forming at an elevated temperature a molten eutectic alloy between the sheet and the substrate and consisting essentially of metal substantially identical to the metal of the metallic sheet and a heat reactive substance, the improvement for implementing a non-bonded member in the conductor pattern, comprising, prior to bonding, partially penetrating through a selected area of the side of the metallic sheet to be bonded to the substrate, said selected area having a length in excess of about 42 mils, whereby the remaining portion of the metallic sheet in the selected area constitutes a member which does not bond to the substrate.

4,500,030

FLANGE WELD TECHNIQUE

James E. Gerber, Walbridge; Robert J. Kovacs, Oregon, and Willy Herrmann, Toledo, all of Ohio, assignors to APX Group, Inc., Toledo, Ohio

Filed Sep. 13, 1982, Ser. No. 417,210
Int. Cl.³ B23K *9/225*
U.S. Cl. 228—125 **12 Claims**



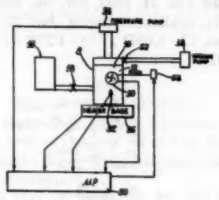
1. A method for manufacturing an exhaust manifold for mounting on an engine head, said method comprising:
providing a flange having opposed first and second sides and at least one aperture therein, said flange being defined by a chamfer at the intersection of said aperature and said second side, said chamfer having an angle of between approximately 20° and approximately 60° and extending into said flange to a depth of between approximately 0.01 inch and approximately 0.15 inch;
providing at least one tube dimensioned to fit in said aperture such that a gap of between approximately 0.01 inch and approximately 0.1 inch exists between said tube and said flange;
inserting one end of said tube into said aperture from the first side of said flange such that said tube extends beyond the surface of the second side of the said flange a distance of up to approximately one-half inch;
welding said tube to said flange about the circumference of said tube from the second side of said flange; and
removing any weld material from the surface of the second side of said flange and removing the portion of the tube which extends beyond the second side of said flange, whereby the portion of said tube extending beyond said flange substantially prevents weld material from entering said tube during said welding, and whereby the removal of said portion of said tube enables proper mounting of said flange on the engine head.

4,500,031

METHOD AND APPARATUS FOR MANUFACTURING A HOT SPOT THERMOCOUPLE

James T. Pettingell, Escondido, Calif., assignor to Robert D. Hancock, Incline Village, Nev.

Filed Jun. 1, 1982, Ser. No. 383,515
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—179 **6 Claims**



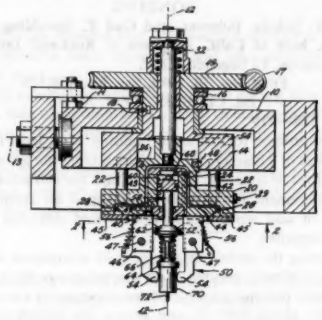
6. Apparatus for constructing a hot spot thermocouple having a body containing lead wires comprising:
setup and holding means for holding a plurality of fine wires having diameters not greater than about 0.01 inches in fixed predetermined relative positions,
welding fixtures means cooperating with said setup and holding means to position said plurality of fine wires for welding,
welding and cutting means cooperative with said welding fixture means for making predetermined welds among said wires in said plurality of wires, and
transfer fixture means cooperating with said setup and holding means to support the hot spot thermocouple body to make predetermined contacts between the lead wires and respective ones of said plurality of wires in substantially predetermined positions, whereby the welding and cutting means cooperates with said transfer fixture means to make welds at said predetermined contacts and cut away excess wire.

4,500,032

METHOD AND APPARATUS FOR PROPER REGISTRATION OF MATING PARTS

Daniel W. Ackerman, Chenango Bridge, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Feb. 16, 1983, Ser. No. 467,082
Int. Cl.³ H01L *21/98*
U.S. Cl. 228—180 A **21 Claims**



1. A method of automated compensating for misalignment of a surface profile of a first body from a pattern on a bottom of said first body and mating said first body pattern within a specified tolerance, with a corresponding pattern on a top of a second body, said method comprising the steps of:
providing a gage pattern in spaced relation from and having the same orientation as said second body pattern;
engaging and gripping said first body at a first station by clamping at least a portion of said surface in a gripper assembly of a translatable head assembly; said gripper assembly being floatable relative to said head assembly within a floatation plane;
translating said head assembly, after attaining said gripping, from said first station to a second station having said gage pattern;
engaging and guiding said first body pattern with said gage pattern, and mating said first body and gage patterns within said specified tolerance;
fixing said gripper assembly relative to said head assembly in said floatation plane; and
disengaging said first body and gage patterns after said fixing, and translating said head assembly and gripped first body to a third station having said second body, and mating said first and second body patterns within said specified tolerance.

9. An apparatus to accomplish automated compensating for misalignment of a surface profile of a first body from a pattern on a bottom of said first body and mating said first body pattern, within a specified tolerance, with a corresponding pattern on a top of a second body, said apparatus comprising:
a gage pattern in spaced relation from and having the same orientation as said second body pattern;

means for engaging and gripping said first body at a first station by clamping at least a portion of said surface in a gripper assembly of a translatable head assembly; said gripper assembly being floatable relative to said head assembly within a floatation plane;

means for translating said head assembly, after attaining said gripping, from said first station to a second station having said gage pattern;

means for engaging and guiding said first body pattern with said gage pattern, and for mating said first body and gage patterns within said specified tolerance;

means for fixing said gripper assembly relative to said head assembly in said floatation plane; and

means for disengaging said first body and gage patterns after said fixing, and for translating said head assembly and gripped first body to a third station having said second body, and for mating said first and second body patterns, within said specified tolerance.

4,500,033

METHOD FOR EXPELLING ENTRAPPED AIR FROM REACTIVE METALLIC LAYUPS PRIOR TO DIFFUSION BONDING

David W. Schulz, Belmont, and Gail E. Spaulding, Redondo Beach, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 30, 1982, Ser. No. 430,570

Int. Cl.³ B23K *35/38, 19/00*

U.S. Cl. 228—219 **12 Claims**

1. In a process for diffusion bonding of at least two metal workpieces of a reactive metal selected from the group consisting of alloys of titanium, zirconium and the refractory metals; the improvement for expelling entrapped air from between surfaces of said workpieces prior to said diffusion bonding, which comprises

precoating the metal surfaces of said workpieces which are to be diffusion bonded, with a substance in the form of an organic polymer capable of decomposing at a temperature above about 800° F. and below the diffusion bonding temperature of said workpieces, to form decomposition products comprising an inert gas having a density greater than air,

heating said workpieces to a temperature above about 800° F. and below the diffusion bonding temperature of said workpieces, and causing decomposition of said substance and forming a first inert gas atmosphere having a density greater than air,

flushing said first inert gas atmosphere together with said entrapped air out of contact with the surfaces of said workpieces, by means of a second inert gas having a density greater than the inert gas of said first inert gas atmosphere, at a temperature above the decomposition temperature of said organic polymer and below the diffusion bonding temperature of said workpieces, and

further heating said workpieces under pressure to cause diffusion bonding of said workpieces, in the absence of entrapped air.

4,500,034

ELECTRONIC CONTROL ARRANGEMENT FOR SYSTEM POWERED HVAC TERMINAL UNITS

James A. Reese, and Raymond H. Dean, both of Johnson County, Kans., assignors to Tempmaster Corporation, Kansas City, Mo.

Filed Sep. 30, 1982, Ser. No. 432,086

Int. Cl.³ F24F *7/00;* **G05D** *23/00*

U.S. Cl. 236—49 **8 Claims**

8. In an air distribution system for applying conditioned air to separate areas of a building, the combination of:

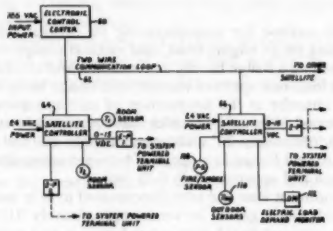
a duct for each area, each duct receiving conditioned air at a relatively high supply pressure and each duct having an outlet for directing the conditioned air into the corresponding area;

a pressure responsive control device for each outlet controlling the flow of conditioned air therethrough;

a pneumatic circuit for each flow control device, each circuit being powered by the supply pressure and including an actuator for controlling the pressure applied to said flow control device in accordance with the pressure conditions of the corresponding actuator;

a pneumatic amplifier in each pneumatic circuit disposed in fluid communication with the corresponding actuator to control the pressure condition thereof;

a thermostat controlled line disposed in fluid communication with each amplifier, each line having a thermostat for controlling the pressure therein;



a common control line communicating with each amplifier and cooperating with the thermostat controlled line to control the pressure of the amplifier;

an electro-pneumatic transducer connected with said control line to control the pressure therein, said transducer being operable to receive electrical signals and to control the pressure in said control line in accordance with the received signal; and

electronic means for sensing a preselected condition in the building and applying to said transducer an electrical signal representative of said condition, whereby the flow of conditioned air into each area is controlled by the thermostat in the area in conjunction with the condition sensed by said electronic means.

4,500,035

EXPANSION VALVE

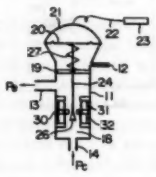
Shigeaki Kuroda, Shimizu; Takao Senshu, Shizuoka; Kensaku Oguni; Taketoshi Mochizuki, both of Shimizu; Hiromu Yasuda, Shizuoka; Kyuhei Ishibane; Akira Atsumi, both of Shimizu; Hideyuki Kimura, and Toshio Hatada, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 21, 1983, Ser. No. 506,384

Claims priority, application Japan, Jun. 25, 1982, 57-108417

Int. Cl.³ G05D *27/00;* **F25B** *41/04*

U.S. Cl. 236—92 B **5 Claims**



1. An expansion valve having a refrigerant inlet passage, a refrigerant outlet passage, a valve chest to which both the inlet and outlet passages open, a diaphragm chamber communicating with a heat-sensitive bulb through a small diameter tube,

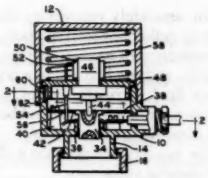
and a valve body actuated in response to an operation of a diaphragm, said valve body being disposed facing a valve seat in said valve chest to regulate a passage defined between said valve seat and said valve body to thereby control the flow rate of a refrigerant, said valve seat is adapted to be axially movable along an inner wall of said valve chest, and means for moving said valve seat in accordance with a change in pressure in a refrigerant circuit including annular bellows attached to both sides of said valve seat, annular fixing seats for respectively fixing the other ends of said bellows, a first passage means for introducing a high pressure fluid into one of said bellows, a second passage means for introducing a low-pressure fluid into the other of the bellows to thereby move said valve seat in accordance with a change in difference between high- and low-pressure side pressures in the refrigerant circuit.

4,500,036

ACTUATING MECHANISM

Rudolf Vollmer, Mosbach, Fed. Rep. of Germany, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 22, 1984, Ser. No. 582,426
Int. Cl.³ G05D *23/20*
U.S. Cl. 236—68 B **8 Claims**



7. A linear actuator comprising, in combination:

a first housing portion having a wall rising from a bottom, and having a longitudinal axis; a displacement piece moveable along said axis and having an end extending to an aperture in said bottom for engaging the device to be actuated;

at least one resilient contact leaf carried by said bottom;

an assembly insertable in said housing portion and including a mounting plate supported on said wall, at least one contact pin positioned on said plate for engagement with said contact leaf, and a thermostatically working element carried by said plate and including a heated coil connected to said pin and a working piston moveable along said axis to engage said displacement piece;

a second housing piece engaging said wall of said first housing piece;

and a compression spring engaging said mounting plate and said second housing portion to urge said plate toward said wall.

4,500,037

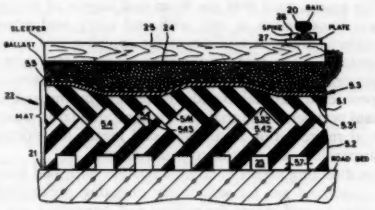
RAILWAY ROAD BED

Hans Braitsch, Bergisch-Gladbach; Hermann Ortwein, and Josef Vorwald, both of Cologne, all of Fed. Rep. of Germany, assignors to Clouth Gummiwerke Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,157
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121946
Int. Cl.³ E01B *2/00, 19/00;* **E01C** *3/00*
U.S. Cl. 238—2 **11 Claims**

1. In a railway track bed having a support surface, at least one resilient mat on said surface for cushioning and sound-damping, a layer of ballast on said mat, at least one sleeper received in said layer of ballast and a rail mounted on said sleeper, the improvement wherein the upper surface of said mat is provided with a hard elastic sheet of metal vulcanized to the mat and preventing penetration of said ballast into said mat.

2. In a railway track bed having a support surface, at least one resilient mat on said surface for cushioning and sound-damping, a layer of ballast on said mat, at least one sleeper received in said layer of ballast and a rail mounted on said sleeper, the improvement wherein the upper surface of said mat is provided with a hard elastic sheet preventing penetration of said ballast into said mat, said mat comprising a pair of slabs of elastomeric material having interfitting formations



defining hollows between said slabs and oriented so as to transform compressive force upon said mat into shear forces between said slabs.

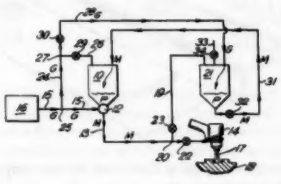
8. A mat adapted to support a layer of ballast in a railroad track bed, said mat comprising a body of elastomeric material overlain by a metal sheet bonded to said body and forming a barrier to penetration by said ballast, said body comprising a pair of slabs having intertitting formations shaped to transform compressive force on said mat into shear forces between said slabs and defining hollows between them.

4,500,038

POWDER FEED SYSTEM WITH RECIRCULATOR FOR PLASMA SPRAY APPARATUS

Alfred De Ferrari, Huntington, and William H. Doddman, Trumbull, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Nov. 1, 1982, Ser. No. 438,027
Int. Cl.³ B05B *7/30, 7/32*
U.S. Cl. 239—85 **8 Claims**



1. An apparatus for spraying a powder material on a workpiece to provide a coating thereon, said apparatus being adapted for rapid starting and stopping of spraying operations, said apparatus comprising:

means for storing and dispensing said powdered material;

means for applying said powdered material onto said workpiece;

powder feed means for carrying said powdered material from said means for storing and dispensing said powdered material to said means for applying said powdered material onto said workpiece;

diverting means in communication with said powder feed means intermediate said feed means and said means for applying said powdered material onto said workpiece, said diverting means being operative for selectively diverting said powedered material away from or towards

said means for applying said powdered material onto said workpiece;

accumulator means in communication with said diverting means for receiving and storing any powdered material diverted from said means for applying said powdered material onto said workpiece;

recirculation means for recirculating said powdered material from said accumulator means to said means for storing and dispensing said powdered material;

a source of pressurized gas in communication with said powder feed means, with said means for storing and dispensing said powdered material and with said accumulator means, such that gas from said source of pressurized gas is operative to mix with and carry said powdered material towards said means for applying said powdered material onto said workpiece, to urge said powdered material from said means for storing and dispensing said powdered material to said powder feed means; and to urge said powdered material from said accumulator means into said recirculation means and said means for storing and dispensing said powdered material; and

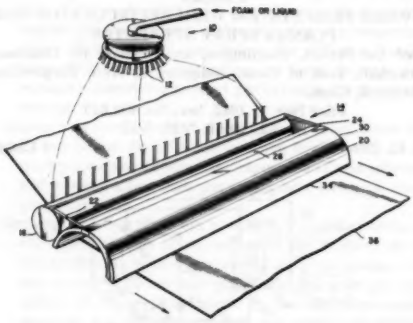
a gas directing means in communication with said source of pressurized gas for selectively directing pressurized gas either to said means for storing and dispensing said powdered material or to said accumulator means.

4,500,039

APPARATUS FOR UNIFORMLY APPLYING EITHER LIQUID OR FOAM COMPOSITIONS TO A MOVING WEB

Joseph A. Pacifici, La Grange, and Clifford A. Bryant, Dalton, both of Ga., assignors to West Point Pepperell, Inc., West Point, Ga.

Filed Oct. 20, 1982, Ser. No. 435,602
Int. Cl.³ B05C *5/02*
U.S. Cl. 239—193 **5 Claims**



1. Apparatus for applying liquid and foam compositions to a moving web, including:

a manifold comprising a pipe having a plurality of inlet ports spaced along its length for receiving said composition, said inlet ports having axes normal to the direction of the axis of the manifold, but offset with respect thereto, whereby movement of said composition as it is received in the manifold is in a vortex;

a curved blade oriented so as to have a crest extending in a substantially horizontal line, said blade terminating in a straight edge on one side of the crest and contacting the manifold along a line parallel to, and below the level of, said horizontal line on the opposite side of the crest;

means for defining a reservoir between said manifold and the curved blade above the line of contact therebetween; and

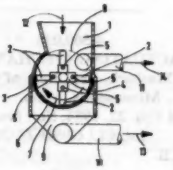
outlet means in the manifold for uniformly discharging said composition from the manifold into the reservoir to cause the reservoir to fill and overflow whereby said composition passes over the crest of the blade and moves as a uniform film along the blade to its edge for deposit onto the web as it moves past said edge.

4,500,040

METHOD AND APPARATUS FOR SEPARATING THE COMPONENTS OF CELLULOSE SANITARY ARTICLES

Bert Steffens, Auf der Jaugel 5, D-5470 Andernach 13, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 386,935
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 3214294; European Pat. Off., Jun. 4, 1982, 82104932.7
Int. Cl.³ B02C *19/12*
U.S. Cl. 241—14 **5 Claims**



1. A process for separately recovering the flock and non-flock components in cellulose-based sanitary articles obtained as waste in the production of panties, diapers, sanitary towels, sick-bed undersheets, and the like, being a composite of cellulose flock and a non-flock carrier formed of plastic, cellulose or rubber sheets, tissues, adhesive tapes, rubber bands and the like, said process comprising the steps of:

(a) delivering the sanitary articles into a chamber having a plurality of rotatable entrainers;

(b) causing said entrainers to break up the sanitary articles so as to provide a mixture of loose cellulose flock and shredded non-flock carrier material;

(c) removing under effect of a first suction source acting through a sieve the loose cellulose flock formed in said chamber prior to the time said non-flock carrier is shredded so finely that the carrier shreds pass through the sieve; and

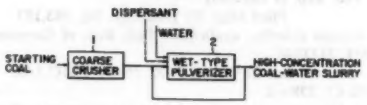
(d) removing under a second suction source acting in the chamber, the non-flock carrier shreds.

4,500,041

PROCESS FOR PRODUCING HIGH-CONCENTRATION SLURRY OF COAL

Kazuhiko Nakaoji, Ichihara; Mitsugu Kamao, Chigasaki; Hayami Itoh, Himeji; Shuhei Tatsumi, and Shoichi Takao, both of Akashi, all of Japan, assignors to Lion Corporation; Kao Corporation; Mitsui Engineering and Shipbuilding Company Limited; Electric Power Development Company Limited, all of Tokyo and Kawasaki Jukogyo Kabushiki Kaisha, Kobe, all of, Japan

Filed Dec. 3, 1982, Ser. No. 446,604
Claims priority, application Japan, Dec. 3, 1981, 56-194776; May 27, 1982, 57-91088
Int. Cl.³ B02C *19/12*
U.S. Cl. 241—16 **7 Claims**



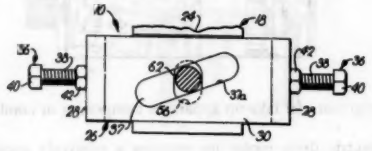
1. A process for producing high-concentration coal-water slurry by pulverizing coal consisting essentially of first coarsely crushing the coal, thereafter subjecting the coarsely

crushed coal thus obtained to a pulverizing process, together with water, in a wet-type pulverizing machine, and feeding back one portion of the finely pulverized coal slurry thus obtained into the inlet of said wet-type pulverizing machine.

4,500,042
TWO-WAY KNIFE ADJUSTMENT FOR CROP HARVESTER CUTTING CYLINDER

Arnold E. Goertz, Buhler, and Ronald K. Guinn, Valley Center, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 23, 1982, Ser. No. 410,376
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—238 **8 Claims**



1. In a rotary cutting cylinder for a crop harvester having a plurality of circumferentially spaced apart knives, and structure supporting the knives for inward and outward adjustment movement along respective paths of travel, the improvement comprising;

means associated with each of said knives for releasably holding same on said structure in a selected position along said path of travel of the knife; and

an adjuster for each knife reciprocable transversely of said path of travel thereof,

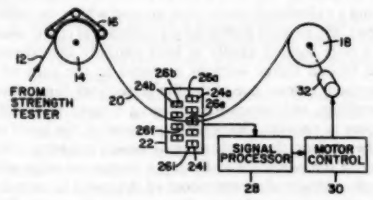
said adjuster having a portion thereof disposed to effect both said inward and said outward movement of each knife in response to reciprocation of the adjuster when said holding means is released,

said portion of the adjuster including a pair of opposed surfaces, each of which is disposed in oblique relationship to said path of travel of each knife, one of said surfaces being coupled in force-transmitting relationship with each knife when the adjuster is shifted transversely of said path of travel in one direction and the other of said surfaces being coupled in force-transmitting relationship with each knife when the adjuster is shifted transversely of said path of travel in an opposite direction.

4,500,043
LOW TENSION WINDING APPARATUS

Patrick C. Brown, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,063
Int. Cl.³ B65H *59/38*
U.S. Cl. 242—45 **5 Claims**



1. An apparatus for automatically controlling the sag depth of a catenary between a feed apparatus that supplies material to the catenary and a take-up apparatus that removes material from the catenary, comprising

a motor for driving said take-up apparatus,

means for illuminating said material in the vicinity of said catenary,

a plurality of photosensitive devices arranged in vertical orientation in the region of the catenary,

a first plurality of voltage generators equal in number to said photosensitive devices, each of said first plurality of voltage generators comprising a switching circuit which is connected to a respective one of said photosensitive devices, and an output resistor, one terminal of which is connected to said switching circuit, the remaining terminal of said output resistor being connected to a power supply by a common output resistor, each said voltage generator being capable of generating a unique voltage which depends upon the vertical position of the photosensitive device connected thereto,

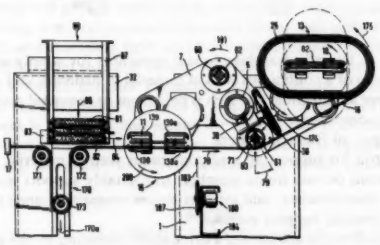
motor speed control means connected to said motor for controlling the rate at which said take-up apparatus removes material from said catenary, and

means for applying to said motor control means a voltage proportional to the voltage generated by the most recently activated voltage generator.

4,500,044
APPARATUS FOR WINDING BOLTS OF CLOTH OR THE LIKE

Heinrich Schnell, Schwanheimerstr. 78a, D-6930 Eberbach, Fed. Rep. of Germany

Filed Aug. 8, 1983, Ser. No. 521,505
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302291; Aug. 7, 1983, 3229506
Int. Cl.³ B65H *19/26, 19/28*
U.S. Cl. 242—56 A **10 Claims**



1. Apparatus for converting a running web into a series of discrete bolts, comprising a source of running web; a support indexible about a fixed axis between first and second positions at 180° with reference to one another; first and second winding devices and first and second deflecting devices mounted on and indexible with said support so that said first winding device assumes an operative position in the first position of said support and receives from said source successive increments of the running web which is maintained in a predetermined path by the first deflecting device while said second winding device and the second deflecting device assume positions of readiness and the second winding device assumes an operative position in the second position of said support and receives from said source successive increments of the running web which is maintained in said predetermined path by said second deflecting device while said first winding device and said first deflecting device assume positions of readiness, said path extending through that winding device which is held in said position of readiness; and means for severing the web intermediate said winding devices upon completed conversion of a length of web into a bolt on the winding device which is held in the operative position, said winding devices being rotatable about axes which are parallel to said fixed axis and each thereof

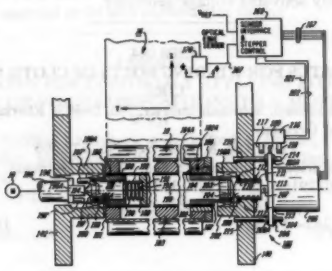
comprising a pair of coaxial rotary bolt holders disposed at the opposite sides of said path and having tongs movable axially with portions of the corresponding bolt holders between retracted positions of disengagement from and extended positions of engagement with the adjacent marginal portions of the web in said path, each of said bolt holders further comprising detent means arranged to maintain the respective tongs in a predetermined angular position in the retracted position of the tongs.

4,500,045

LATERALLY TRANSLATABLE ROLL APPARATUS

Angus H. Whitaker, Monte Sereno; Keith E. McFarland, Woodside; William A. Lloyd, Los Altos, and Willard J. Patrick, Los Gatos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1983, Ser. No. 526,939
Int. Cl.³ B65H *25/26*
U.S. Cl. 242—57.1 **12 Claims**



1. A laterally translatable roll apparatus for supply and/or take-up of a continuous web of material to maintain said roll in proper alignment as the web is paid from or rewound onto said roll, comprising:

a pair of frame members;

a roll for supporting said continuous web of material;

means on said frame members to rotatably support said roll therebetween, said support means comprising open ended bearing support means;

roll drive means having a drive shaft extending to one end of said roll;

interengagable coupler means on the output end of said roll drive shaft and said roll one end to permit said roll to be rotatably driven by said roll drive shaft while allowing for immediate lateral disengagement of said coupler means upon removal of the other end of said roll from said open ended bearing support means;

means axially mounted at said roll one end and biased to move axially outward away therefrom for engagement against said drive shaft output end;

lateral translation drive means mounted on the other of said frame members with translation output means engaging in axially aligned, abutting contact relation the other end of said roll,

said axially aligned, abutting contact relation to permit disengagement of said roll other end from said translation output means by singularly lifting said roll other end from its open ended bearing support means while not interfering either with the lateral operation or rotational operation of said roll when said roll is positioned for said operations in said open ended bearing support means;

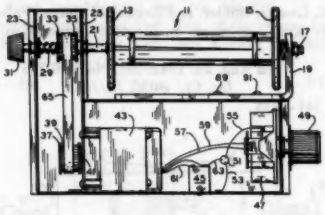
control means to operate said lateral translation drive means to translate said lateral output means.

4,500,046

STRIP MATERIAL TAKE-UP APPARATUS

William E. Woenker, Pierceton, Ind., assignor to Chem-Elec, Inc., North Webster, Ind.

Filed Nov. 22, 1982, Ser. No. 443,649
Int. Cl.³ B65H *23/20*
U.S. Cl. 242—67.1 R **6 Claims**



1. Strip material take-up apparatus comprising in combination:

an electric drive motor for exerting a relatively constant rotor torque substantially independent of the motor speed of operation, the drive motor torque being directly related to the magnitude of the voltage applied thereto;

a rheostat coupling the drive motor to a source of electrical energy and operator controllable to allow a user to select the magnitude of the voltage applied to the drive motor and therefore also the speed independent torque and the strip material tension;

an expandible mandrel for receiving, in its expanded condition, strip material, the mandrel comprising a hollow cylindrical core having axially extending slots extending from an end face of the core toward and terminating short of the opposite end face of the core with adjacent slots extending in opposite directions from opposite core end faces; and

means positively drivingly coupling the motor and mandrel in a slip-free manner to wind strip material about the mandrel as that material becomes available while maintaining tension on the strip material substantially constant independent of strip material movement;

first manually operable release means for allowing removal of the mandrel from the apparatus; and

second manually operable release means effective in a first state to maintain the mandrel in its expanded condition and effective in a second state to allow the mandrel to collapse somewhat to facilitate removal of strip material from the mandrel.

4,500,047

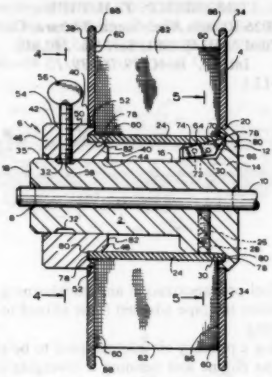
SPOOL ADAPTOR

Philip Merlin, 3 Gladwyne Ct., Spring Valley, N.Y. 10977

Filed Jul. 14, 1983, Ser. No. 513,683
Int. Cl.³ B65H *75/18*
U.S. Cl. 242—71.9 **13 Claims**

1. An adaptor for use with a spool of coiled elongated material having a cylindrical center core around which the material is wrapped, the adaptor comprising a cylindrical center section having a bore formed axially at least partially therethrough, first and second flange sections mounted to the ends of the center section, at least one of the flange sections being removable therefrom, and means for engaging a spool mounted on the adaptor to prevent rotational movement of the spool relative to the adaptor, the spool engaging means including a blade mounted on the adaptor and having a sharpened edge which engagingly contacts the center core of the spool to secure the spool in place on the adaptor, the center section including a cylindrical boss situated at an outermost end of the center section, a cylindrical inner hub adjacent the boss which is

dimensioned to be closely received by the core of the spool so as to prevent radial movement of the spool on the adaptor and



a main body portion extending from the inner hub to the opposite end of the center section.

4,500,048

CENTRIFUGAL BRAKE DEVICE, ESPECIALLY FOR THE AUTOMATIC WINDING OF AN ELECTRICAL CABLE

Albert R. Schaller, Rilkeweg 1, 7573 Sinzheim, Fed. Rep. of Germany

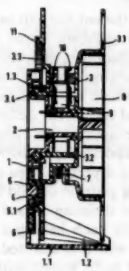
PCT No. PCT/DE81/00003, § 371 Date Jun. 23, 1982, § 102(e) Date Jun. 23, 1982, PCT Pub. No. WO82/01624, PCT Pub. Date May 13, 1982

PCT Filed Jan. 2, 1981, Ser. No. 394,911

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040143

Int. Cl.³ B65H *75/48;* **F10D** *59/00*

U.S. Cl. 242—107.3 **9 Claims**



1. A device for the automatic winding up of a cable comprising:

a base plate (1) having a pivot spindle (2) and a journal pin (4) spaced from said spindle, said base plate further having a brake collar (6); having a hub rotatably mounted on said pivot spindle; and

a brake wheel (5) rotatably mounted on said journal pin for engagement, in a speed amplifying manner, with said drum, said brake wheel having centrifugal braking means appliable to said braking collar when said wheel rotates;

said base plate having a generally planar member with said pivot spindle and journal pin extending from the same side of the planar base plate member so that the device may be assembled by sequentially placing said brake wheel on said journal pin and said drum on said pivot spindle, said pivot spindle and journal pin being so spaced on said base plate member as to place said brake wheel at least partially behind said drum for retaining said brake wheel on said journal pin, said braking collar surrounding said journal pin on said same side of said base plate member, said base plate member having means for retaining said drum, and hence said brake wheel, on said base plate member so as to retain said device in an assembled condition.

4,500,049

DEVICE FOR AUTOMATICALLY STOPPING A TAPE RECORDER

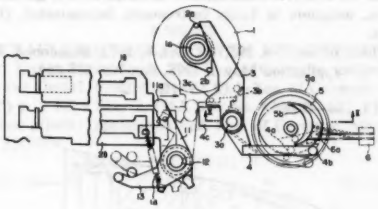
Masanori Sugihara, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 1, 1982, Ser. No. 413,842

Claims priority, application Japan, Sep. 2, 1981, 56-130478[U]; Sep. 2, 1981, 56-130479[U]

Int. Cl.³ B65H *59/38;* **G03B** *1/04;* **G11B** *15/32*

U.S. Cl. 242—186 **7 Claims**



1. A device for automatically stopping a tape recorder, comprising; a takeup reel pulley, a sensing arm attached to said takeup reel pulley, a pivot shaft, a stop lever urged against said sensing arm and angularly movable about said pivot shaft, a stop arm extending from said pivot shaft, means for resiliently coupling said stop arm to said stop lever, said stop arm including a switch actuator projection, switch means for enabling said tape recorder to enter a stop mode when said switch means is actuated, and means for urging said projection into contact with said switch means in response to stoppage of said takeup reel pulley to thereby actuate said switch means.

4,500,050

MAGNETIC TAPE CASSETTE

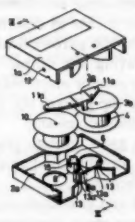
Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 12, 1983, Ser. No. 522,761

Claims priority, application Japan, Aug. 19, 1982, 57-124452[U]

Int. Cl.³ G11B *15/08*

U.S. Cl. 242—198 **6 Claims**



1. A magnetic tape cassette comprising:

a lower cassette half having a light emitting element insertion hole therein, said insertion hole being defined by a

cylindrical wall having a plurality of vertically extending grooves;

an upper cassette half secured to said lower cassette half;

a tape supplying reel and a tape winding reel juxtaposed in said cassette inside a space defined by said upper and lower cassette halves; and

a reel retaining plate having opposite end portions which depress tops of said reels, said reel retaining plate having a plurality of protrusions at a central portion thereof, said protrusions being engaged with said grooves of said cylindrical wall such that a central portion of said reel retaining plate is held between a top surface of said cylindrical wall and an inner wall of said upper cassette half.

4,500,051

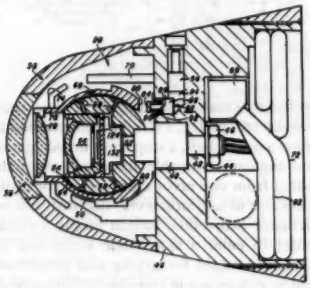
GYRO STABILIZED OPTICS WITH FIXED DETECTOR

Wilbur W. Cottle, Jr., and Lilburn R. Smith, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 295,746, Oct. 6, 1972, abandoned. This application May 8, 1975, Ser. No. 575,684

Int. Cl.³ F41G 7/22

U.S. Cl. 244—3.16 **9 Claims**



1. A method for guiding to a target a cannon launched guided projectile having a timer, stabilizing fins, a direction finding signal processor electronic means, a gyro-optical system, a gyro, an electrical drive means and projectile guidance means comprising:

(a) activating the timer upon setback to time an unguided portion of the projectile's trajectory;

(b) deploying the stabilizing fins during the unguided portion of the projectile's trajectory to stabilize the projectile against spin;

(c) sequentially activating the direction finding signal processor electronic means to determine, responsive to signals generated by the gyro-optical system, target acquisition, while delaying the output of projectile guidance signals of the processor electronic means and during the delay, activating the gyro of the gyro-optical system and the projectile guidance means;

(d) precessing the gyro through pitch and yaw signals received from the direction finding signal processor to align the gyro with the target;

(e) providing pitch and yaw angle signals from the direction finding signal processor electronic means for producing pitch and yaw guidance signals; and

(f) applying the pitch and yaw guidance signals to an electrical drive means to selectively actuate the projectile's guidance means to align the projectile with the target.

4,500,052

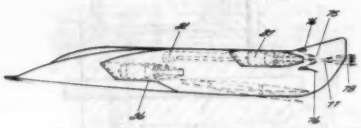
LIQUID FUEL PREVAPORIZATION AND BACK BURNING INDUCTION JET OVAL THRUST TRANSITION TAIL PIPE

Kyusik Kim, 5026 Rhoads Ave., Santa Barbara, Calif. 93111

Filed Mar. 5, 1981, Ser. No. 240,619

Int. Cl.³ B64C 29/00, 39/10

U.S. Cl. 244—12.1 **8 Claims**



1. A liquid fuel prevaporization and backburning induction jet thrust transition tail pipe adapted to be affixed to a turbojet engine comprising

means defining a primary air inlet adapted to be affixed to a said turbojet engine and defining a diverging area in the transition tailpipe located downstream therefrom, said diverging area defining means including means for forming a vertically converging and horizontally diverging thrust nozzle, said diverging area defining means further including means defining a pair of air plenums each having an air inlet plenum which is adapted to direct an air/ram flow into a main airflow path defining means including means defining a bellmouth shaped inlet which communicates with an airflow inducing nozzle having a diverging downstream throat which terminates in a chamber having a downstream end opening, each of said airflow path chambers end openings defining a secondary inlet to said diverging area;

a plurality of parallel, vertically spaced curved inductor vanes positioned in the secondary inlets to the diverging area, said inductor vanes being adapted to deflect a secondary airflow passing through said bellmouth shaped airflow inducing nozzle, through said throat and chamber and through the secondary inlet into a path through said diverging area which is substantially directed towards said thrust nozzle;

means positioned adjacent the exit nozzle and ahead of said thrust nozzle for defining upper and lower liquid fuel prevaporization chambers adapted to the outstream surface of said diverging area of transition tail pipe, fuel injecting means which are positioned in the prevaporization chambers and means for defining vaporized gas outlets from said prevaporization chambers;

means defining a vaporized gas distributing manifold positioned around said diverging area and ahead of said horizontally diverging portion of said thrust nozzle, said distributing manifold defining means having a plurality of distributing orifices each having a convergent-divergent discharge nozzle which is adapted to direct a vaporized gas flow into and to be mixed with the airstream within said diverging area, each of said discharge nozzles having a discharge opening which is downstreamwardly inclined towards said thrust nozzle and adjacent a secondary inlet of said diverging area and responsive to the velocity of the airstream slipflow passing over the downstreamwardly inclined discharge openings producing a vacuum within the prevaporization chambers through the distributing manifold and the discharge nozzles wherein the vacuum has a pressure within the prevaporization chambers which is varied by the injection of liquid fuel into the prevaporization chambers by the injection means;

an ignitor positioned adjacent the discharge outlets at the vaporized gas-air mixing point which ignites the vaporized gas-air mixture at a location upstream from the thrust nozzle such that the ignited vaporized gas-air mixture combustion occurs in said thrust nozzle.

4,500,053

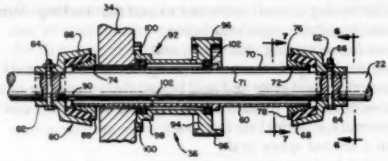
PROPELLER AND ENGINE MOUNTING DEVICE

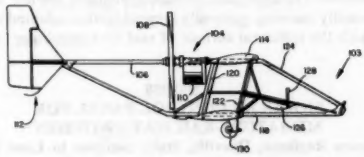
Rolf Brand, 212 N. Mecklenburg Ave., South Hill, Va. 23970

Continuation-in-part of Ser. No. 213,458, Dec. 5, 1980, Pat. No. 4,382,566. This application Jul. 30, 1982, Ser. No. 403,697

Int. Cl.³ B64C 11/00; B64D 27/00

U.S. Cl. 244—54 26 Claims





1. A device for mounting an aircraft engine and a propeller on a longitudinal member of an aircraft comprising:

a sleeve having first and second ends disposed about said longitudinal member,

a securing means for preventing longitudinal movement of said sleeve relative to said longitudinal member,

a vibration dampening means disposed between at least a portion of said securing means and said sleeve,

an engine mounting means for mounting said engine on said sleeve, and

an attaching means on said sleeve for attaching said propeller for rotation about said sleeve,

said propeller being rotatable about the longitudinal axis of said longitudinal member.

4,500,054

MOUNTING SYSTEM FOR COUPLED TURBOSHAFT GAS TURBINE ENGINES

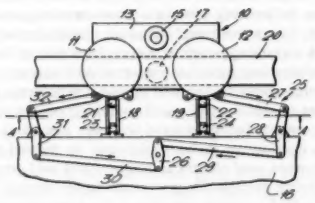
Alfred W. Osborn, Harrow, England, assignor to Rolls-Royce Limited, London, England

Filed Oct. 6, 1983, Ser. No. 539,736

Claims priority, application United Kingdom, Oct. 29, 1982, 8231063

Int. Cl.³ B64D 27/00, 27/16

U.S. Cl. 244—54 6 Claims



1. A coupled gas turbine engine/coupling gearbox assembly comprising first and second gas turbine engines, a coupling gearbox, said first and second gas turbine engines being attached to said coupling gearbox so that the longitudinal axes of said engines are parallel, a vehicle, and a mounting system mounting said assembly on said vehicle, said mounting system comprising a mounting supporting said gearbox for pivotal movement of said assembly relative to said vehicle but which prevents longitudinal movement of said assembly relative to said vehicle, and first and second strut members which respectively support said first and second gas turbine engines from said vehicle, each of said strut members being pivotally attached to said vehicle and its respective gas turbine engine so as to permit lateral and longitudinal movement of each of said gas turbine engines relative to said vehicle, said gas turbine engines being interconnected with an intermediate member rotatably mounted on said vehicle by a plurality of link members, said link members interconnecting said gas turbine engines and opposite sides of said rotatably mounted member with respect to its axis of rotation in such a manner that any relative lateral movement between said gas turbine engines is unconstrained and results in said intermediate member being rotated about its axis of rotation by said link members, but that all lateral movements of said gas turbine engines relative to said vehicle which are in unison are constrained by said link members and intermediate member.

4,500,055

AIRCRAFT PROPULSION SYSTEM ARRANGEMENT

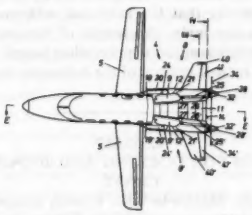
Hubert Krojer, Bermatingen, Fed. Rep. of Germany, assignor to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,651

Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219159

Int. Cl.³ B64C 27/00, 29/04

U.S. Cl. 244—55 11 Claims



1. In an aircraft structure comprising a main fuselage (2) having a circular or approximately circular cross-section for cabin pressurization and a rear section (3), which is provided with a wing (5), said fuselage containing a power plant (4) in the rear section thereof, said power plant consisting of at least two independently operating propulsion units (8,8') each comprised of an engien (9,9') and a rearwardly extending drive shaft (25,25') terminating in a propeller spinner (32,32') having a pusher propeller (31,31') with propeller disk (34,34') mounted thereon, the improvement which resides in that

(a) the fuselage rear section is formed by a central section (11) and lateral spindle-shaped engine nacelles (12,12'), where said central section and said engine nacelles form a structural unit with a blending outer contour and extend directly from the main fuselage section and together contain the propulsion units,

(b) the longitudinal axis of each engine assumes an outwardly diverging position in the direction of the fuselage rear end,

(c) the engines are positioned in the region of the main fuselage section partially within the main fuselage section and partially with the engine nacelles,

(d) the engine nacelles comprise spaces for the reception of air supply (20,20') and exhaust gas ducts (21,21') lateral of the engine, and

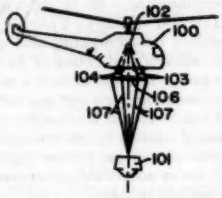
(e) the outer contour of the engine nacelles tapers in the area of their rear end into the circular contour of the propeller spinners.

4,500,056

AIRCRAFT TOWING AND CARRYING LINKAGE SYSTEMS HAVING HIGH STABILITY

Leonard B. Della-Moretta, 1796 Russell Pl., Pomona, Calif. 91767

Division of Ser. No. 240,199, Mar. 3, 1981, Pat. No. 4,438,944.
This application Sep. 28, 1982, Ser. No. 425,714
Int. Cl.³ B64D 9/00
U.S. Cl. 244—137 R 2 Claims



1. A method of suspending a load from a helicopter, comprising:

selecting a stable point within the helicopter body from which a load could best be suspended, near its center of gravity;

mounting at least three generally symmetrically located ball jointed links connected at one end of the helicopter and connected at the other end to a rigid subframe in a manner so that extended lines on which the links lie intersect generally at the selected point of stability; and

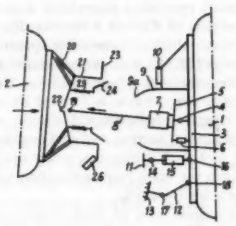
suspending the load from the frame by a plurality of lines in such a manner that the load and subframe may swing rigidly as one body, the length of the suspension lines being selected to adjust the pendulum length of the load to avoid the natural periods of the helicopter's pitch and roll motions.

4,500,057

MECHANISM FOR DOCKING AND JOINING SPACE CRAFT

Alain J. Duwelz, Mantes-la-Ville, France, assignor to Societe Nationale Industrielle Aerospatiale, France

Filed Jun. 8, 1983, Ser. No. 502,193
Claims priority, application France, Jun. 15, 1982, 82 10446
Int. Cl.³ B64G 1/64
U.S. Cl. 244—161 4 Claims



1. A mechanism for docking and joining space craft comprising:

(a) in a first space craft:

a plate articulated to said first space craft by means equivalent to a ball and socket joint centrally located on said plate for permitting pivoting movement of said plate about its center;

actuating means for pivoting said plate;

a storable tubular extendable boom member formed of supple individually windable metallic bands which cooperate when unwound to form said boom;

boom storage and extension means mounted on said plate for storing said metallic bands and extending them to form said boom;

a first locking element connected to the free end of said boom;

a cable having an end connected to said first locking element and extendable with said boom;

means for retracting said cable; and

a first centering element comprising an open first envelope encircling said plate and said boom, the outer edge of said envelope being formed to provide an outwardly convex generally spherical surface; and

(b) in a second space craft:

a second locking element mounted on said second space craft and adapted to interlock with said first locking element; and

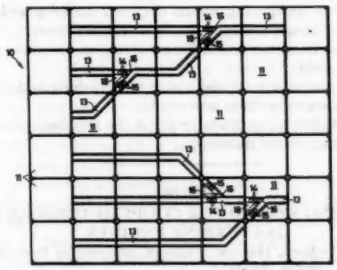
a second centering element encircling said second locking element, said second centering element having an outwardly opening, generally conical surface adapted to mate with the spherical surface of said first envelope.

4,500,058

MODULAR CONTROL PANEL FOR MINIATURE-RAILWAY SWITCHES

Francesco Reginato, Dueville, Italy, assignor to Lima S.p.A., Vicenza, Italy

Filed May 19, 1982, Ser. No. 379,711
Claims priority, application Italy, May 25, 1981, 21883/81[U]
Int. Cl.³ B61L 25/06, 27/02
U.S. Cl. 246—3 9 Claims



1. A panel for controlling the actuation of the switches at the crossings of a miniature railway line, said panel comprising:

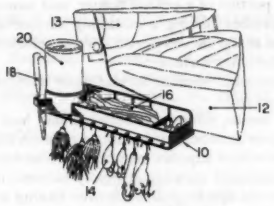
(a) a support in one surface of which at least a portion of a miniature railway line is reproduced by means of grooves which correspond to a corresponding portion of the tracks of the miniature railway line, at least some of said grooves bifurcating into two downstream grooves at a plurality of control panel switching points corresponding to track switching points at which the tracks of the miniature railway line bifurcate into two downstream tracks;

(b) electrical contacts disposed in said downstream grooves adjacent to said control panel switching points, said electrical contacts being adapted to make electrical contact with a conductive stylus which can be moved through said grooves, said electrical contacts and said conductive stylus being electrically connected to an electric control circuit which actuates switches at the corresponding ones of said track switching points; and

(c) a direction indicator mounted on said support adjacent to each of said control panel switching points and between the two downstream grooves emanating from each of said control panel switching points, each of said direction indicators being movable by physical contact with said

conductive stylus between a first position in which it blocks a first one of the two downwstream grooves emanating from the corresponding one of said control panel switching points and unblocks the second one of the two downstream grooves emanating from the corresponding one of said control panel switching points and a second position in which it blocks the second one of the two downstream grooves emanating from the corresponding one of said control panel switching points and unblocks the first one of the two downstream grooves emanating from the corresponding one of said control panel switching points, whereby the position of said direction indicators provides a visual indication of the position of the corresponding switches in the miniature railway line.

4,500,059
FISHING SEAT TRAY
John L. Papizan, 3753 Aletha Dr., Baton Rouge, La. 70814
Filed Aug. 18, 1982, Ser. No. 409,118
Int. Cl.³ A47C 7/62
U.S. Cl. 248—205.1 **1 Claim**



1. A tray assembly for connection to a fisherman's seat comprising, in combination:

a. a tray for containing fishing lures, said tray having

i. a top side,

ii. a flat, planar bottom side,

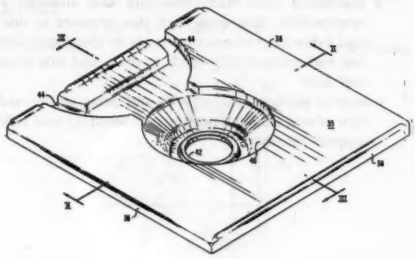
iii. a side wall extending vertically upwardly from said top side of said tray and horizontally along the length of the tray,

iiii. a horizontal lip connected to said side wall adapted to be placed under the bottom of a fisherman's seat,

iiiii. two parallel longitudinal slots located on said bottom side of said tray, said longitudinal slots being parallel to said side wall,

b. a generally rectangular, elongated plate for attaching said tray to a seat, said plate having a bottom side and a top side, said plate having a first portion which is adapted to extend beneath the bottom of said seat and a second portion which extends beneath the bottom of said tray, said first portion having a hole therein in which is received a fastener to connect said plate to the bottom of said seat, said top side of said second portion of said plate having two parallel, longitudinal ridges thereon adapted for receipt in two longitudinal slots located on said bottom side of said tray, the surface of said second portion of the top side of said plate on each side and between said two ridges being a flat, generally rectangular plane adapted to contact and support said flat, planar bottom side of said tray, said bottom side of said plate being a flat, generally rectangular plane, the top side of said first portion of said plate being a flat, generally rectangular plane adapted to contact the flat bottom of said seat, said plate being adapted to connect to the bottom of a fisherman's seat to bias said horizontal lip against the bottom of said fisherman's seat and to bias said sidewall against a side of said fisherman's seat.

4,500,060
SWIVEL-TILT PLATFORM
William C. Anderson, Grand Rapids; Bruce K. Boundy, Holland, and Raoul J. P. Schoumaker, Wyoming, all of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 11, 1982, Ser. No. 387,640
Int. Cl.³ A47B 91/00
U.S. Cl. 248—349 **7 Claims**



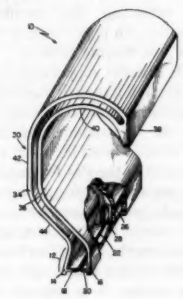
1. A mounting pedestal for supporting a computer terminal display device or the like comprising;

a base portion having a flat upper peripheral surface, an annular inwardly and downwardly sloped spherical segment interiorly of said flat upper peripheral surface and a central aperture through said base portion;

a tilt platform having a central spherical segment bottom portion with a central aperture therethrough and laterally extending cylindrical segments extending outwardly of said spherical segment, said spherical segment bottom portion of said tilt platform being complimentary to and constructed and arranged to rest on said spherical segment in said base portion with said outwardly extending cylindrical segments overlying said upper peripheral surface of said base portion; and

a platform top overlying said tilt platform, said platform top having a planar upper surface with a central aperture therethrough and at least one trough portion in said planar upper surface interconnecting one edge of said platform top with said central aperture.

4,500,061
HOLDER
Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Jun. 1, 1983, Ser. No. 499,918
Int. Cl.³ B65D 35/56
U.S. Cl. 248—359 I **11 Claims**



1. A unitary holder of molded plastic material for a tubular

package that has a transverse base portion, said holder comprising a two spaced sidewall portions,

a flange at the lower end of each said sidewall portion,

said flanges being in spaced opposed alignment and defining therebetween a slot for receiving the neck of the tubular package and said sidewall portions spaced apart sufficiently to receive the base portion of the tubular package, and

a stabilizing web interconnecting said sidewall portions intermediate their ends such that pressure at one end of said sidewall portions that tends to close said slot at said one end concurrently tends to open said slot at the other end, and

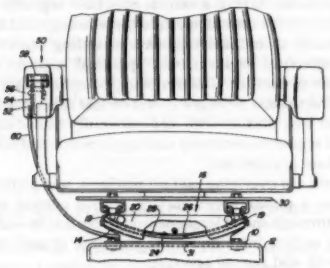
a support portion integral with and being an upward extension of said sidewall portions for securing said holder to a support member.

4,500,062

ADJUSTABLE SEAT LEVELING MECHANISM

Leonard E. Sandvik, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 15, 1982, Ser. No. 441,357
Int. Cl.³ B60N 1/02
U.S. Cl. 248—371 **4 Claims**



1. A vehicle seat support system comprising:

a platform rigidly mounted on the vehicle;

an elongated arcuate rail member fixed to and projecting from the platform, extending along an arc of a circle, and having a first elongated bearing surface extending transversely to a fore-and-aft axis of the vehicle, the rail member comprising a vertically extending upright member and a horizontally extending cross member forming a T-shaped cross section, an upper surface of the cross member forming the first bearing surface;

an elongated guide member supporting the seat and having an arcuate slot receiving the rail member, the guide member having a second elongated bearing surface extending transversely to the fore-and-aft axis, the guide member slot having a T-shaped cross sectional area;

bearing means located in the slot for engaging the first and second bearing surfaces and for permitting lateral movement of the guide member relative to the rail member along an arc of a circle, the support system having at least one position wherein the entire first bearing surface is in contact with the bearing means and wherein the entire second bearing surface is in contact with the bearing means; and

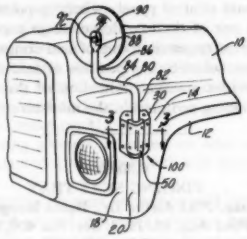
latch means for holding the seat in selected positions with respect to the platform.

4,500,063

FENDER MOUNT FOR A MIRROR

William P. Schmidt, 21000 Woodruff, Rockwood, Mich. 48173, and Franklin D. Hutchinson, 28000 Bell Rd., New Boston, Mich. 48164

Filed Mar. 20, 1981, Ser. No. 245,886
Int. Cl.³ B60R 1/02
U.S. Cl. 248—475.1 **9 Claims**



1. A mount adapted for securing a mirror support member to the curved portion of a vehicle fender, said mount comprising:

a base member having a mounting surface adapted to be secured to the curved portion of the vehicle fender and an opposite outer surface;

a cover member secured to said outer surface of said base member; and

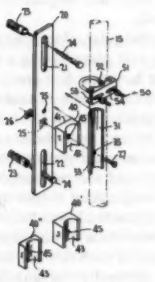
aperture means, interposed between said base member and said cover member, for holding a predetermined length of the the mirror support member therebetween so that the mirror support member is rigidly secured to the vehicle fender, said aperture means further having at least two rib members extending between said base member and said cover member, one of said at least two rib members forming a stop and the other of said at least two rib members having portions defining a bore for frictionally engaging the mirror support member.

4,500,064

MAST SUPPORT ASSEMBLY

Philip Calabro, 9025 Linton St., Silver Spring, Md. 20901

Filed Jan. 12, 1983, Ser. No. 457,359
Int. Cl.³ A01K 97/10
U.S. Cl. 248—539 **17 Claims**



1. A mounting assembly for securing a mast to a wall, said mounting assembly comprising:

a mounting plate having a flat rear surface;

a mast-receiving cradle member having an elongated mast support surface extending axially parallel to the lengthwise dimension of the mast and having an arcuate cross-section, wherein the axial length of said support surface is at least twice the arcuate length of said cross-section;

means for mounting said mounting plate on said wall with the entire flat rear surface disposed flush against the wall, said means for mounting including at least two lengthwise-spaced mounting holes defined through said mounting plate;

means securing said cradle and said mounting plate to one another in spaced relation such that, when said mounting plate is secured to said wall, the axial dimension of said support surface extends generally parallel to and is spaced transversely from said wall; and

means for clamping the mast against said cradle member at said support surface.

4,500,065

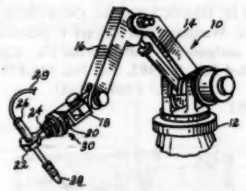
RELEASABLE TOOL MOUNT FOR MANIPULATOR

Daniel M. Hennekes, Morrow; David E. Suica, Lebanon, and Robert F. Beckman, Cincinnati, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 1, 1982, Ser. No. 353,512

Int. Cl.³ B66C *23/88*

U.S. Cl. 248—542 **10 Claims**



1. Apparatus for releasably mounting tools to a mechanical manipulator comprising:

a. a tool mounting plate;

b. a housing having a recess, defined by the walls of said housing, for receiving the mounting plate and a surface for attachment to the manipulator;

c. a plurality of support pins disposed peripherally upon the mounting plate, each support pin having a free end projecting beyond the periphery of the plate and a second end retained by the mounting plate;

d. a plurality of pin receptacles disposed within the side walls of the recess, each receptacle receiving the free end of a support pin, the support pins and receptacles suspending the mounting plate within the recess such that a relative force between the mounting plate and housing, irrespective of the direction thereof, effects relative motion of the mounting plate and housing; and

e. preload means attached to the mounting plate for resisting forces acting along the longitudinal axes of the support pins in the direction away from the receptacles, each preload means being connected between the second end of a support pin and the mounting plate, the magnitude of the relative force between the mounting plate and housing required to release the mounting plate being determined by the force required to overcome the preload resistance to dislodge at least one support pin from its associated receptacle.

4,500,066

ELECTRO-HYDRAULIC CONTROL ACTUATOR FOR TURBINE VALVES

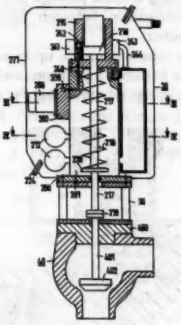
Werner Trassl, Mülheim an der Ruhr, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

Continuation of Ser. No. 265,626, May 20, 1981, abandoned. This application Feb. 15, 1984, Ser. No. 579,295

Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019602

Int. Cl.³ F16K *31/122*

U.S. Cl. 251—26 **4 Claims**



1. Electro-hydraulic control actuator assembly for turbine valves, comprising a turbine valve having a valve cone being movable between an open and a closed position of said valve, a shaft connected to said valve cone, a valve housing, an integrated compact actuator unit disposed on said valve housing and combined with said valve, said actuator unit including an electro-hydraulic converter, a hydraulic control cylinder being connected to said electro-hydraulic converter and having a control piston connected to said shaft for moving said valve cone to said open position of said valve, a power spring connected to said shaft for absorbing movement of said valve cone into said open position of said valve and for resetting said valve cone for rapid closing be spring loading, and a hydraulic fluid supply system, said supply system including a hydraulic fluid reservoir, first and second fluid pumps each being fed from said fluid reservoir and each having a pressure side, first and second electric motors each driving a respective one of said pumps, a hydraulic pressure accumulator subdivided into at least two part-accumulators, and piping disposed in said actuator unit connecting said part-accumulators to said pressure side of said pumps and to said hydraulic control cylinder for providing hydraulic fluid for an opening motion of said valve, each of said part-accumulators having a hydraulic fluid storage volume sufficient for providing hydraulic fluid for at least one full opening motion of said valve even if one of said part-accumulators is inoperative, said fluid pump having a flow capacity being dimensioned for continuously replenishing leakage losses and for slowly filling said pressure accumulator, and said second fluid pump being operable when said first fluid pump is inoperative.

4,500,067

PILOT OPERATED LOW FLOW VALVE

Keith E. Zukausky, Hanover, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 7, 1983, Ser. No. 464,307

Int. Cl.³ F16K *31/126*

U.S. Cl. 251—38 **4 Claims**

1. A pilot operated pressure actuated valve comprising;

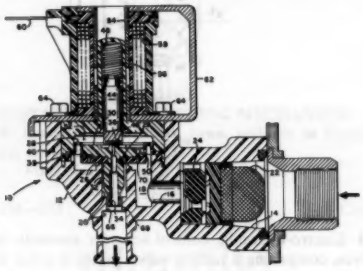
(a) body means defining a valve inlet port and a valve outlet port and a valving cavity communicating with said inlet

and outlet ports and having a valving surface disposed in the flow path therebetween;

(b) pressure responsive main valve means operable to divide said cavity into a first valving chamber and a second chamber communicating with said inlet and said outlet and operative to move between a position contacting and a position spaced from said valving surface for alternately preventing and permitting flow from said inlet to said outlet, said main valve means including a pilot flow passage therethrough communicating said first chamber with said outlet and including a pilot valve seat;

(c) means defining a bleed passage providing limited continuous communication between first chamber with said second chamber;

(d) pilot valve means operable upon actuation and deactuation to move between a position contacting and a position spaced from said pilot valve seat for alternately permitting



and preventing flow from said first chamber to said outlet passage; and

(e) guide means including an extended portion movable with said main valve means to direct movement thereof, said extended portion including flow restriction means comprising a raised surface disposed circumferentially thereabout and cooperating with said outlet port to create a desired pressure drop thereacross upon opening of said main valve means,

wherein said bleed passage permits pressure equilibrium in said first and second chambers when said main and pilot valve means are each in their respective flow preventing positions and, upon said pilot valve means opening fluid flows from said first chamber through said pilot passage to said outlet causing a pressure differential across said main valve means thereby causing said main valve means to open.

4,500,068

AIR VALVE

Donald C. Rasmussen, deceased, late of Barrington, Ill. (by Jaunice O. Rasmussen, executor), and James A. Kozel, deceased, late of Elmhurst, Ill. (by Violet M. Kozel, executor), assignors to The Singer Company, Stamford, Conn.

Filed Mar. 31, 1983, Ser. No. 480,983

Int. Cl.³ F16K *1/00*

U.S. Cl. 251—205 **6 Claims**

1. An air valve comprising,

a body having an inlet and an outlet,

a partition in the body between the inlet and outlet and separating the interior of the body into inlet and outlet chambers,

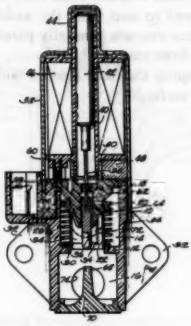
a sleeve valve slideably mounted in the partition,

a generally conical metering cone fixed in the inlet chamber, said sleeve valve being reciprocable relative to the cone,

a spring biasing the sleeve valve to a seat surrounding the base of said cone,

a stem connected to the valve and projecting through the cone,

an actuator acting on the stem to position the sleeve valve relative to the cone, the air flow from the inlet to the outlet being in the clearance between the sleeve valve and the cone,



the sleeve valve having an inward offset near the end which engages the seat whereby the outside diameter of the sleeve valve for the greater part of its length is substantially the same as the inside diameter of the sleeve valve between the offset and the end which engages the seat.

4,500,069

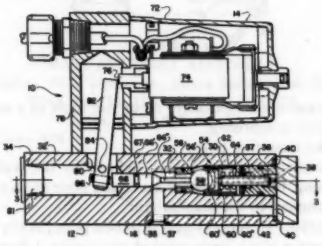
HYDRAULIC DIRECTIONAL CONTROL VALVE

Ralph R. Barber, Waxhaw, and Eckart F. Schultze, Charlotte, both of N.C., assignors to Duff-Norton Co., Charlotte, N.C.

Filed Feb. 5, 1982, Ser. No. 346,175

Int. Cl.³ F16K *39/00*

U.S. Cl. 251—282 **6 Claims**



1. In a ball-type fluid directional control valve comprising a valve body having formed therewithin a valve chamber for receiving pressurized fluid and a fluid exhaust passageway, an annular valve seat in one wall surface of said chamber defining a valve seat opening providing fluid communication between said chamber and said passageway, a ball in said chamber adapted for seated engagement in said valve seat to sealably close said valve seat opening, and a ball retaining member disposed in said chamber in engagement with said ball in opposition to said valve seat, said retaining member having a head portion engaging said ball and a stem portion extending from said head portion oppositely of said ball through another wall surface of said chamber generally opposite said valve seat to exposure exteriorly of said chamber, said ball and said retaining member being selectively movably toward and away from said valve seat to engage and disengage said ball in said valve seat, the improvement comprising the cross-sectional area of said stem portion taken substantially parallel to said valve seat at said another wall surface of said chamber being less than the

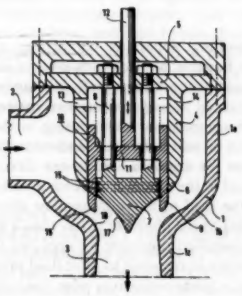
cross-sectional area of said valve seat opening, said head portion having an annular engaging surface in sealing contact annularly about said ball substantially parallel to said valve seat and defining a cross-sectional area greater than said cross-sectional area of said stem portion at said another wall surface, said stem portion and said head portion cooperating with said valve seat opening to leave exposed to pressurized fluid in said chamber only a reduced net effective surface area of said ball and said retaining member for application thereagainst by said pressurized fluid in said chamber of a relatively slight valve closing force sufficient alone to bias said ball and said retaining member into engagement in said valve seat to reduce the force required in opposition to said pressurized fluid to open said valve while maintaining said retaining member in sealing contact with said ball to prevent separation thereof, said stem portion extending sealably in said valve body to communication with an area exteriorly of said chamber of a fluid pressure lower than said pressurized fluid in said chamber, said annular engaging surface of said head portion forming therewithin a ball receiving recess and said stem portion having formed therein a bore opening to said recess at one end thereof and to said lower pressure area at the other end thereof to relieve any fluid pressure at the location of contact between said annular engaging surface and said ball to permit said pressurized fluid to apply said valve closing force against said net effective surface area to maintain said retaining member in contact with said ball.

4,500,070

VALVE FOR ADJUSTING THE RATE OF FLOW OF A GASEOUS FLUID

Gilbert Riollet, Paris, and Raymond Bessay, Belfort, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed Aug. 12, 1982, Ser. No. 407,411
Claims priority, application France, Aug. 25, 1981, 81 16204
Int. Cl.³ F16K *39/04*
U.S. Cl. 251—282 **2 Claims**



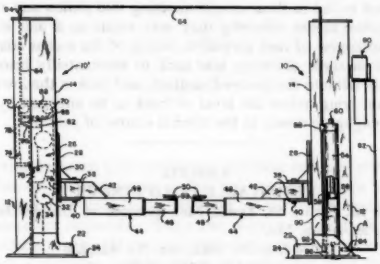
1. A valve for adjusting the rate of flow of a gaseous fluid, said valve comprising a valve body (1) of tubular form including a large diameter inlet portion (1*a*) leading to a small diameter outlet portion (1*c*) via tapered portion (1*b*), said large diameter inlet portion having a radial side fluid inlet (2) at pressure Po, said small diameter outlet portion (1*c*) forming an axial end fluid outlet (3), a cylindrical housing (4) fastened within the large diameter inlet portion (1*a*) of said body (1) by means (5) located externally of the fluid flow path between the inlet (2) and the outlet (3), and obturator (10) fitted with a stem (12) actuated by operating means and slidably mounted within said housing, said obturator (10) having a front part (9) engageable against a seat (18) defined by said tapered portion (1*b*) so as to shut off said outlet (3) and a rear part within the housing (4), said cylindrical housing forming a chamber, means subjecting said chamber to a pressure comparable with the pressure Po of the fluid at the inlet (2), the improvement wherein said housing (4) terminates in a conical streamlined nose-piece (7) within said tapered portion (1*b*) of said valve body, said nose-piece (7) having a tip within the small diameter outlet portion (1*b*) of said valve body, such that said nose-piece (7) forms with said valve body tapered portion (1*b*) a narrow conical flow passage leading to said outlet (3), and wherein the front part (9) of said obturator (10) is in the form of a hollow cylinder surrounding with limited clearance said nose-piece (7) and with limited clearance within said cylindrical housing (4), and said nose-piece (7) is attached to the housing (4) by rigid arms (8) within said housing (4), whereby unsteady forces acting on said obturator by fluid flow from the inlet to the outlet are minimized through the full range of travel of the obturator between open and closed positions, while insuring a low level of fluid flow head loss when the valve is fully open.

4,500,071

DUAL HYDRAULIC LIFTS

Bobby F. Bagwell, 52 W. Main St., and Rickey D. Wells, 50 W. Main St., both of Broadalbin, N.Y. 12025

Filed Sep. 3, 1982, Ser. No. 414,886
Int. Cl.³ B66F *7/12*
U.S. Cl. 254—423 **8 Claims**



1. Apparatus for lifting large loads such as vehicles and the like comprising a pair of lifting units set in opposition to each other to straddle said load, each lifting unit comprising a vertical standard, a cantilevered arm mounted on said standard for movement therealong, and a hydraulic actuator for raising and lowering said arm, one actuator functioning as a master comprises a cylinder, a piston located in said cylinder and dividing the same into lower and upper chambers, and a piston rod extending from said piston outwardly of the upper chamber and connected to said cantilevered arm, the other actuator functioning as the slave comprises a cylinder having a single chamber, a piston located therein, and a piston rod extending from said piston outward of said chamber and connected to its associated cantilevered arm, a source of fluid under pressure and means for serially transfering fluid from said source to said master actuator and thence to said slave actuator said means comprising a first conduit connecting said source of fluid to said lower chamber of said master actuator, and a second conduit connecting said upper chamber of said master actuator to said single chamber of said slave actuator and valve means operable to effect passage of fluid between said lower and upper chambers of said master cylinder, establishing equal pressure in the chambers of said master and slave actuators and to effect thereafter simultaneous and uniform movement of the pistons in said master and slave actuator.

4,500,072

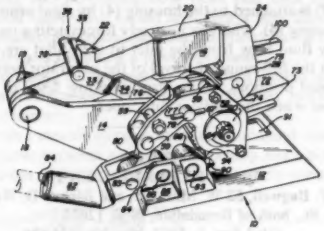
LOW PROFILE JACK CONSTRUCTION

David S. Leong, Lincolnwood, Ill., assignor to Templeton Kenly & Company, Broadview, Ill.

Filed Sep. 30, 1982, Ser. No. 430,106
Int. Cl.³ B66F *3/00*
U.S. Cl. 254—95 **13 Claims**

1. A readily collapsible jack construction particularly

adapted for use in railway track maintenance comprising a curved rack pivotally movable about a stationary pivot from a lowered position to an elevated position; railway track engaging means supported by said rack movable with said rack into the elevated position; a rotatable pinion engageable with said rack for moving said rack into the elevated position; rotatable drive means in adjacent relationship with said pinion and rotatable with said pinion about a stationary axis of rotation; means adapted to fail in shear interconnecting said pinion and rotatable drive means whereby they may rotate as a unit in the normal course of rack elevation; failure of the means adapted to fail in shear allowing said rack to substantially instantaneously fall into the lowered position; said rack in the lowered position lying below the level of track to be engaged by the track-engaging means in the normal course of jack use.

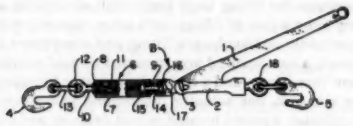


4,500,073

ADJUSTABLE LOAD BINDER

Lonnie M. Smith, St. Louis, Mo., assignor to Durbin-Durgo, Inc., St. Louis, Mo.

Filed Sep. 29, 1982, Ser. No. 426,838
Int. Cl.³ B25B *25/00*
U.S. Cl. 254—258 **3 Claims**



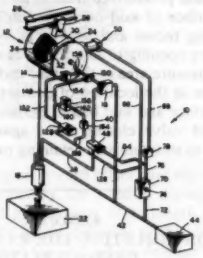
1. In an adjustable load binder for use in securing a load held by tie means such as a chain, cable, or the like, said binder being of the type including a lever means and a clevis means, each having a securing means connected thereto for fastening onto the said tie means during load securement, pivot means mounting said lever means for shifting with respect to the said clevis means in, a first direction to a binding position and in an opposite direction to a second, loosened position, the improvement which comprises, an adjustable linkage interconnecting between one of the said securing means and one of the lever means and clevis means for facilitating the prompt adjustment of the load binder during attachment to the tie means, said adjustable linkage being disposed remote and exteriorly of the lever means and clevis means to avoid any interference with their functioning, the adjustable linkage including a sleeve member having opposite ends, thread means provided within the sleeve member, a threaded connector adjustably connecting with one of the ends of the sleeve member, the connector attaching the adjustable linkage to one of the securing means, and a swivel connector attached to the opposite end of the sleeve member and attaching the adjustable linkage to one of the lever means and clevis means, and wherein the said swivel means includes a stud means, said stud means being shaped at one end to facilitate the maneuverability of the adjustment means in its connection with the load binder.

4,500,074

FLUID-OPERATED APPARATUS FOR HANDLING AND LIFTING LOADS

Albert D. Fox, Novi; Robert J. Kish, Flint, and Donn C. Knight, Madison Heights, all of Mich., assignors to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.

Continuation-in-part of Ser. No. 477,927, Mar. 23, 1983, Pat. No. 4,478,390, which is a continuation-in-part of Ser. No. 351,943, Feb. 24, 1982, Pat. No. 4,462,571. This application Nov. 10, 1983, Ser. No. 550,374
The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.
Int. Cl.³ B66D *1/08, 1/48*
U.S. Cl. 254—270 **6 Claims**

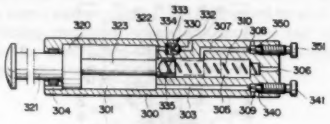


1. Load-handling apparatus comprising a fluid-operated hoist having a housing, a piston moveable in said housing, said housing and said piston forming a fluid chamber, a hoist drum rotatably supported in said housing and rotated as said piston moves in a lineal path in said housing, a flexible, elongate member wound on said hoist drum and extending downwardly from said drum for urging a load in one direction when fluid pressure applied to the chamber exceeds a particular value and for enabling the load to move in another direction when the pressure applied to the chamber is less than a particular value, a pilot fluid-controlled regulator for applying fluid pressure to said fluid chamber in response to pilot fluid pressure applied to said regulator, a load-responsive, pilot fluid regulator for applying pilot fluid to said pilot fluid-controlled regulator, a blocking valve between said pilot fluid-controlled regulator and said chamber having one position enabling communication between said pilot fluid-controlled regulator and said chamber and a second position isolating said pilot fluid-controlled regulator from said chamber, an adjustable flow control valve communicating with said blocking valve for bleeding air from said blocking valve to enable said blocking valve to move from the second position to the one position, a fluid-operated brake having a brake shoe engagable with and retractable from said hoist drum, means for controlling the supply of fluid to said brake, and a manually-operated, fluid-control valve for supplying fluid to said fluid chamber independently of said pilot fluid-controlled regulator and said load-responsive, pilot fluid regulator, said manually-operated, fluid-control valve also supplying fluid to said blocking valve to move said blocking valve from the one position to the second position when said manually-operated, fluid-control valve supplies fluid to said hoist chamber.

4,500,075
AIR PRESSURE SHOCK ABSORBER

Tatsuo Tsuchiya, and Kazuhiro Hozumi, both of Asahi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma and Kuroda Precision Industries Ltd., Kawasaki, both of, Japan

Filed Dec. 17, 1981, Ser. No. 331,752
Claims priority, application Japan, Dec. 18, 1980, 55-179176
Int. Cl.³ F16F 9/48
U.S. Cl. 267—8 R **5 Claims**



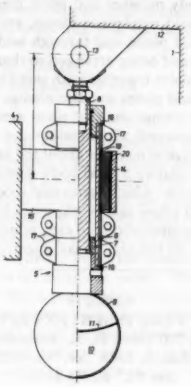
1. An air pressure shock absorber comprising:
a cylinder defining a first opening at one end of said cylinder;
a first chamber defined by said cylinder having a forward chamber portion and a rear chamber portion;
a first piston slidably mounted in said first chamber;
a first piston rod mounted on said first piston, said first piston rod extending fron the cylinder through said first opening;
spring means located in the cylinder for moving the piston by a pressing force;
a second chamber of smaller diameter than said first chamber defined by said cylinder located contiguous with the forward portion of said first chamber;
a second piston rod mounted at one end to the first piston opposite to said first piston rod;
a second piston slidably mounted in said second chamber of the cylinder, the other end of said second piston rod mounted on said second piston and said second piston being of said smaller diameter; and
a bypass passage defined by an aperture in a wall of said cylinder communicating between said second chamber and the atmosphere, and said bypass passage rapidly releases compressed air in a forward portion of said first chamber of the cylinder to the atmosphere when the second piston moves a predetermined distance to position itself past the aperture to open said bypass passage to said first chamber due to a force pushing on an end of the outwardly extended first piston rod.

4,500,076
ARRANGEMENT IN SPRING SUSPENSION SYSTEMS PARTICULARLY FOR VEHICLES

Jan-Erik Rova, Laerkvaegen 20, S-981 37 Kiruna, Sweden

Continuation of Ser. No. 355,948, Mar. 8, 1982, abandoned. This application Jul. 10, 1984, Ser. No. 628,975
Claims priority, application Sweden, Mar. 10, 1981, 8101518
Int. Cl.³ B62D 27/04
U.S. Cl. 267—8 R **6 Claims**

1. In a device for resiliently supporting a driver's compartment which is subjected to vibrations in a heavy-duty vehicle having a nonresilient wheel suspension, said compartment having at least one seat therein and being connected to a frame portion of said vehicle by means of a spring suspension system comprising a plurality of springs which are disposed in spaced relation to one another and which are located respectively between said compartment and said frame portion, each of said springs being located substantially at the horizontal level of the center of gravity of said compartment, the improvement wherein each of said springs in said spring suspension system comprises a hydropneumatic spring which includes an elongated rigid cylindrical casing having a pressurized chamber connected to one end of said casing, a piston which is slideably movable within said casing along the central axis of said casing, said piston being connected to a piston rod which protrudes outwardly of the other end of said casing and which is connected by means of an articulated joint to one of said compartment and frame portion, said spring being connected to the other of said compartment and frame portion by an elastomeric bushing which surrounds the exterior of said cylindrical casing at an intermediate position on said casing and a bracket which connects said elastomeric bushing to the other of said compartment and frame portion, said piston being located within said

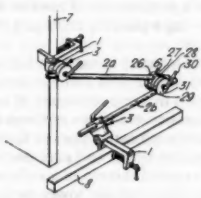


casing between said elastomeric bushing and said pressurized chamber whereby said piston and said articulated joint are located respectively on opposite sides of said bushing, and means for adjustably fixing the position of said elastomeric bushing along said casing so as to adjust the distance between said elastomeric bushing and said articulated joint thereby to adjust the spring characteristic of said spring suspension system.

4,500,077
DEVICE FOR CLAMPING WORKPIECES

John R. Coxon, Penfound, Stane St., Pulborough, Sussex, England

Filed Jul. 15, 1983, Ser. No. 514,095
Claims priority, application United Kingdom, Jul. 16, 1982, 8220736
Int. Cl.³ B25B 1/22
U.S. Cl. 269—45 **7 Claims**



1. In a device for holding two workpieces in relative positions which can be varied and for holding a single workpiece from a support in a spatial position which can be varied, said device comprising first and second workpiece clamps, each of said clamps being arranged to hold a workpiece of to be fixed to a support, an elongate cylindrical member and a clamping device for mounting each of said first and second clamps to said cylindrical member, said clamping devices allowing said first and second clamps to be adjusted in a position along a longitudinal axis of said cylindrical member; to be adjusted in an angular position around said longitudinal axis and also to be

adjusted in an angular position about a second axis which is perpendicular to said longitudinal axis and about a third axis which is perpendicular to said second axis, the improvement wherein each of said clamping devices by which said first and second clamps are mounted on said elongate member includes a single clamping screw for operating said clamping device, two plates arranged face to face, means defining registering grooves in said two plates, said elongate member being held in said grooves, a body member and pivot means attaching said body member to said workpiece clamp, said clamping screw passing through said plates and through said body member to said pivotal means and being arranged so that, when tightened, it clamps the said plates together with said elongate cylindrical member between said plates and also clamps said plates to said body member and clamps the said pivot means against movement, and, when loosened, allows said plates to turn relative to said elongate cylindrical member about the axis thereof; allows said plates to turn relative to said body member about the axis of said clamping screw, which forms said second axis; and frees said pivot means to allow said workpiece clamp to pivot relative to said body member about an axis, which forms said third axis, perpendicular to the axis of said clamping screw.

4,500,078

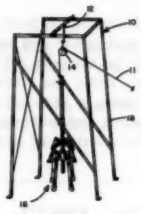
CHIMNEY FLUE INSERTION APPARATUS

Gerald J. Brennan, 710 Third St. S., Moorehead, Minn. 56560

Filed Jan. 3, 1983, Ser. No. 455,203

Int. Cl.³ B23Q *1/00*

U.S. Cl. 269—46 **4 Claims**



1. Pipe stacking apparatus comprising in combination:

(a) a threaded rod;

(b) a jointed coupler attached to one end of said threaded rod and coupled to means for imparting a rotative force to said coupler and rod;

(c) a sleeve mounted about said rod so as to freely revolve therearound at a predetermined position along the length thereof and having a plurality of fingers radiating orthogonally therefrom;

(d) a plurality of L-shaped arms, each having a major portion of a length longer than a minor portion and each of said arms coupled to a respective one of said fingers at the juncture of the major and minor portions and the opposed outermost end of each major portion formed to grasp the inside of a pipe into which said pipe stacking apparatus is inserted and to extend therefrom a sufficient length to be insertable into a successively lower positioned length of pipe;

(e) a plurality of coupling links, each coupled at one end to be opposed outermost end of a respective one of the minor portions; and

(f) screw follower means coupled to the opposite ends of said coupling links and threadably mounted to and rotatively movable along said rod for causing the pipe grasping end of the major portions of said L-shaped arms to expand or contract in a radial fashion relative to said rod, thereby grasping or releasing a length of pipe into which said apparatus is inserted and permitting the end-to-end stacking of lengths of pipe.

4,500,079

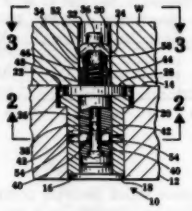
REMOVABLE AND REPLACEABLE LOCATING PIN FOR LOCATING A WORKPIECE ON A SUB-PLATE FOR MACHINING

Manfred Morghen, San Diego, Calif., assignor to General Dynamics Corporation/Convair Div., San Diego, Calif.

Filed Jan. 30, 1984, Ser. No. 575,234

Int. Cl.³ B23Q *3/10*

U.S. Cl. 269—47 **5 Claims**



1. A removable and replaceable locating pin adapted to locate a workpiece on a sub-plate for machining of the workpiece comprising:

a receiver bushing adapted to be received within an aperture within a sub-plate at a pre-determined location, said bushing is provided with a radially extending flange at one end thereof which cooperates with the sub-plate for precisely vertically positioning the bushing within the aperture in the sub-plate;

a locating means removably positioned within the receiver bushing and extending above the upper surface of the sub-plate for cooperating with the workpiece positioned on the sub-plate, the head portion of the locator pin has a longitudinally extending generally diamond shaped configuration wherein at least one face thereof is rounded for intimate contact with the inner surface of the aperture in the workpiece; and

actuatable ball lock means cooperating with the receiver bushing and the locator means to precisely locate the locating means in a pre-determined position for precision machining of the workpiece and to permit selective removal of the locating means for replacement with another locating means having a different configuration.

4,500,080

CARRIER FOR CLEANING AND ETCHING WAFERS

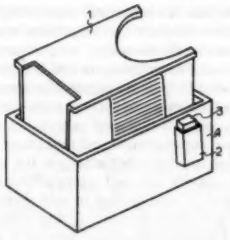
Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,732

Claims priority, application Japan, Mar. 15, 1982, 57-36024[U]

Int. Cl.³ B23Q *1/04*

U.S. Cl. 269—56 **5 Claims**



1. In a carrier for supporting a single lot of prescribed sheets of semiconductor wafers so as to transfer the single lot of

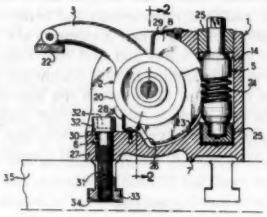
prescribed sheets of semiconductor wafers from one processing step to another processing step in their cleaning and etching processing, in combination with equipment for effecting the steps, the improvement comprises said carrier having an information member holder and an information member detachably supported by said holder, and the informatin member includes a semiconductor chip which constitutes a microprocessor and reading and writing memory, said holder being formed on said carrier as an integral part thereof and being shaped in the form of a pocket for said information member, and an input/output control unit connected to said equipment for effecting the steps, which unit receives said information member for controlling said equipment and storing information about the steps.

4,500,081

CLAMP APPARATUS, ESPECIALLY FOR CLAMPING A PART ONTO A MACHINE TOOL

André Carossino, Louveciennes, France, assignor to Carossino Freres, France

Filed Dec. 23, 1983, Ser. No. 564,844
Claims priority, application France, Jan. 5, 1983, 83 00072
Int. Cl.³ B23Q *3/02*
U.S. Cl. 269—93 **6 Claims**



1. Clamp apparatus comprising a housing presenting a base and a wall, fixing means projecting from said base for fixing said housing to a support, said housing containing a disc mounted in said housing for rotation about an axis parallel to said base, at least one fixed cheek member mounted in said wall, said cheek member and said disc presenting cooperating generally cylindrical radial bearing surfaces and cooperating generally planar annular lateral bearing surfaces, a clamp arm projecting from said disc through an aperture in said wall for engaging a part to be clamped, a toother sector solid with said disc at a portion thereof generally diametrally opposite to said arm, screw means mounted in said housing and cooperating radially with said toothed sector whereby to rotate said disc and said clamp arm, said disc presenting at least one outer cylindrical surface portion between said clamp arm and said toothed sector, and at least one scraper blade juxtaposed with said wall and said outer cylindrical surface portion whereby to close substantially a gap between said outer cylindrical surface portion and said wall, wherein said annular lateral bearing surface of said disc and said outer cylindrical surface portion are substantially contiguous, and said annular lateral bearing surface of said cheek member is disposed at least approximately flush with the inner surface of said wall.

4,500,082

ROTARY BUSINESS FORM PRINTING PRESS

Masayuki Izume, Kyoto, Japan, assignor to Taiyo Ltd., Osaka, Japan

Filed Nov. 30, 1983, Ser. No. 556,921
Int. Cl.³ B41F *13/56*
U.S. Cl. 270—20.1 **15 Claims**

1. A rotary business form printing press comprising:

the sheet feed mechanism **1** having a feed roller **20** for the web **14**,

the printing mechanism **2** having the plate cylinder **80** the impression cylinder **82** which contacts to the plate cylinder **80** directly or through the blanket cylinder **81**,

the punching unit **158** having pin wheels **166** and die wheels **171**, the counterparts of the pin wheels,

a vertical perforation unit **160** having processing heads **190** provided with vertical perforation cutters **191**,

cross perforation units **161** and **162** having a perforation cylinder **195**,

the zigzag folding unit **211**,

the whole drive mechanism **6** and

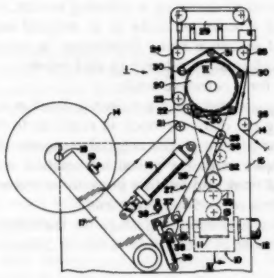
the control unit **7**,

wherein

the differential gear **33** for controlling the velocity of the feed roller provided with the motor **34** which speed control is performed by the control unit **7** being provided between the feed roller **20** and the drive mechanism **6**,

an adjustment device for the impression cylinder **109** which adjusts the wheel base between the impression cylinder **82** and the plate cylinder **80** or the blanket cylinder **81** contacting thereto by using the motor **125** controlled by the control unit **7** being provided in the printing mechanism **2**,

motors for adjusting the positions which are controlled by the control unit **7** and permit the wheels **166**, **171** and the processing heads **190** to travel right and left being provided in the punching unit **158** and the vertical perforation unit,



rotational angle detecting devices **104** being provided on the revolving shaft **94** of the plate cylinder **80**, on the revolving shafts **164** of the wheels **166** and **171** in the punching unit **158**, on the revolving shaft **194** of the perforation cylinder **195** and on the revolving shaft **233** for driving the zigzag folding unit **211** respectively,

the differential gear **33** for adjusting the vertical register provided with the motor **34** controlled by the control unit **7** being provided between these revolving shafts **94**, **164**, **194**, **233** and the drive mechanism **6**,

and the control unit **7** having the functions of adjusting:

the rotation speed of the feed roller **20** through the differential gear **33** according to the previously-set paper thickness,

the wheel base between the impression cylinder **82** and the plate cylinder **80** or the blanket cylinder **81** contacting thereto through the adjustment device for the impression cylinder **109** according to the previously-set paper thickness,

the positions of the wheels **166**, **171**, in the punching unit **158** and of the processing heads **190** in the vertical perforation unit **160** through said motor for adjustment of position according to the previously-set contents, and

the vertical register by making the revolving shafts **94**, **164**, **194** and **233** of the plate cylinder **80**, the wheels **166**, **171** in the punching unit **158**, the perforation cylinder **195** and the zigzag folding unit **211** respectively to rotate to the

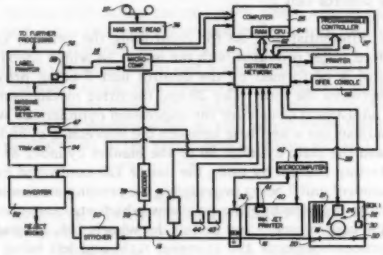
previously-set angular position through the differential gear.

4,500,083

COLLATING AND BINDING SYSTEM AND METHOD WITH POSTAGE INDICATION

Did-Bun Wong, Elmhurst, Ill., assignor to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Dec. 8, 1983, Ser. No. 559,398
Int. Cl.³ B65H *39/02*
U.S. Cl. 270—54 **41 Claims**



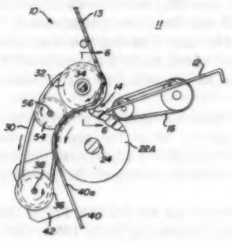
1. A method of operating a collating system, comprising:
producing a series of books in an original sequence, such original sequence being determined in accordance with postal information relative to such books;
checking for a defective book;
generating a signal when a defective book is detected;
reordering the defective book in response to the generated signal at a point in the original sequence determined in accordance with the postal information relative to the rejected book and another book to produce the series of books in a revised sequence; and
deriving an indication of postage for the nondefective produced books in accordance with the revised sequence.

4,500,084

STRIPPER MECHANISM FOR DOCUMENT SEPARATING APPARATUS

George P. McInerny, Andalusia, Pa., assignor to Technitrol, Inc., Philadelphia, Pa.

Filed Jul. 27, 1983, Ser. No. 517,683
Int. Cl.³ B65H *3/52*
U.S. Cl. 271—35 **11 Claims**



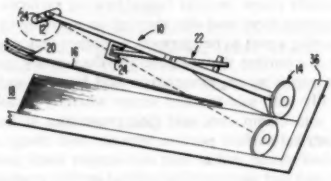
1. A document separating apparatus for separating documents such as sheets or the like from a stack thereof comprising:
a frame,
a feed roller means mounted for rotation with a first rotating drive shaft mounted on said frame,
a stripper means mounted on said frame in opposed relation to said feed roller means for counter-rotation to said rotation of said feed roller means,
a bin for holding a stack of documents,
said feed roller means and stripper means being mounted adjacent the bottom end of the stack of documents in said bin for receiving documents fed from the bottom of said stack into a document feeding area where said feed roller means moves in the direction of feed of the documents through the apparatus and said stripper means moves counter to said direction of document feed for stripping all but the bottom document entering the document feeding area, and
a pair of stripper idlers mounted for free-wheeling rotation on a second shaft and located in said document feeding area with said stripper means therebetween,
each of said stripper idlers having a circular rim constructed and arranged to contact the surface of said feed roller means in said document feeding area with an interference fit so that when no document is present between said feed roller means and said stripper idlers, said stripper idlers are caused to rotate with said feed roller means in the direction of movement of documents through the apparatus, said circular rims of said stripper idlers being flexible away from said feed roller means and being constructed and arranged such that when documents are present between said stripper idlers and said feed roller means, a desired pressure is applied to said documents that allows the bottom document to be fed in the desired direction through the apparatus by said feed roller means without creating an excessive force which tends to lock the bottom document by friction to the document thereabove.

4,500,085

OSCILLATING WHEEL PAPER ITEM STACKING APPARATUS

Wilson P. Rayfield, Longwood; Emmett B. Peter, III, Orlando, and Richard E. Shultz, Maitland, all of Fla., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 14, 1983, Ser. No. 485,092
Int. Cl.³ B65H *31/00*
U.S. Cl. 271—207 **10 Claims**



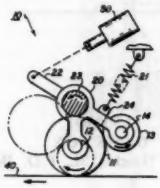
1. Sheet item stacking apparatus comprising;
elongated, articulated means capable of moving both side to side and forwardly and rearwardly relative to an item receiving hopper;
means coupled to said articulated means providing forward and rearward movement thereof,
rotatable means disposed on the free end of said articulated means and including means providing one way rotation of this latter means,
means coupled to said articulated means for translating said forward and rearward movement into side to side movement effective to drive a sheet item forwardly into said item receiving hopper and sideways therein so as to edge align said item with other like items previously forwarded to said hopper.

4,500,086

ROTATING INVERTER

Gerald M. Garavuso, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1982, Ser. No. 445,878
Int. Cl.³ B65H *5/00*
U.S. Cl. 271—225 **8 Claims**



1. An inverter device for use in a sheet conveying apparatus, comprising:
a drive shaft;
dual pivotable collars supported by said drive shaft;
dual pair of primary and secondary rollers mounted through yoke means to said dual collars such that said primary rollers are driven by said drive shaft while said secondary rollers are simultaneously driven by said primary rollers, said primary and secondary rollers being adapted to convey a sheet in a first or second direction; and
means for independently pivoting said dual collars from a first position to a second position so that when both collars are in said first position a sheet is driven by said primary rollers in said first direction and when only one of said collars is pivoted into said second position the sheet is rotated 180° in a horizontal plane due to the driving of a primary and secondary roller and when both collars are pivoted into said second position the sheet is driven in said second direction by the driving of said dual pairs of secondary rollers.

4,500,087

DROP TRAY SORTER

R. Clark DuBois, Fairfield, Conn., assignor to Gradco Systems, Inc., Santa Ana, Calif.

Filed Jan. 17, 1983, Ser. No. 458,581
Int. Cl.³ B65H *39/11*
U.S. Cl. 271—293 **10 Claims**

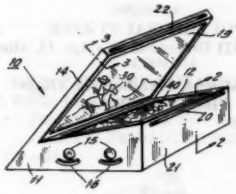
1. In a sheet-sorter for a photocopier, which photocopier includes a carriage and a cover and which discharges a sheet along a path into said sorter,
a plurality of trays,
a frame to support said trays,
the frame including vertical guides for the inboard end of each of said trays and a support for the outboard end of each of said trays,
said trays having support portions extending into said guides,
said vertical guide having upper and lower horizontally offset sections meeting at and forming a step in said frame engageable by said support portions to support the inboard ends of the trays above the sheet-path,
a pusher to move the support portions of the lower-most tray in a stack of trays off said step, and
a drive-mechanism to move said pusher into engagement with said support portions on said step when a sheet has passed from the photocopier into the sorter to move the support portions of said lower-most tray to the lower guide section.

4,500,088

3D DISPLAY

Richard J. Lasky, Clifton, N.J., assignor to Trans-World Manufacturing Corporation, E. Rutherford, N.J.

Filed Jun. 28, 1983, Ser. No. 508,552
Int. Cl.³ A47F *11/06*
U.S. Cl. 272—8 M **19 Claims**



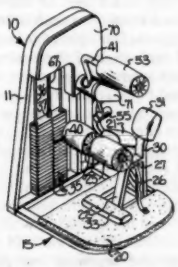
1. A display device, comprising:
a generally planar light transmitting surface having a background image located thereat;
a generally planar mirror having a foreground image located thereat;
first means for projecting light through said light transmitting surface onto said mirror for reflection thereby;
second means for maintaining said light transmitting surface at an acute angle with respect to said mirror such that said light transmitting surface may be viewed by looking at said mirror along an axis which is within said acute angle whereby said background and foreground images are superimposed on each other when viewed along said axis to create the illusion that the background image is located behind said foreground image thereby creating a three-dimensional scene.

4,500,089

WEIGHT LIFTING LOWER BACK EXERCISING MACHINE

Arthur A. Jones, Lake Helen, Fla., assignor to Nautilus Sports/-Medical Industries, Inc., Lake Helen, Fla.

Filed Jan. 20, 1983, Ser. No. 459,508
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—117 **13 Claims**



1. A machine for exercising the muscles associated with the lower back of the user and comprising

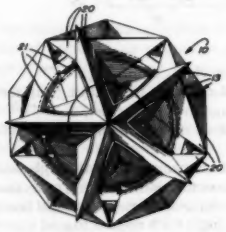
(a) a frame,
(b) a seat connected to said frame for supporting the user,
(c) resistance means for opposing movement of a user while the latter is positioned on said seat, said resistance means being connected to said frame,
(d) user-actuated lever means for engaging the back of a user while a user is positioned on said seat, said lever means having one end pivotally connected to said frame, the other end of said lever means continuously engaging the back of the user at a position spaced above the waist of the user, said lever means being movable in an arcuate path of movement between a first position with the spine of the user in a forwardly bent position, and a second position with the spine in a substantially straight position, and
(e) means operatively connecting said lever means with said resistance means for transmitting movement of said user-actuated lever means between said first and second positions for exercising the muscles associated with the lower back of the user.

4,500,090

POLYHEDRAL PUZZLE

Antoliano Nieto, 3421 Drummond St. - Apt. 15, Montreal, Canada H3G 1X7

Filed May 14, 1982, Ser. No. 378,293
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **3 Claims**



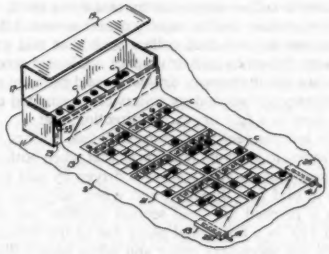
1. A polyhedral puzzle comprising a central body, of regular polyhedron shape, having faces defined by congruent regular polygons, as many intermediate bodies as there are central body faces, and each of frustum shape defining a base face of the same congruent regular polygon shape as the central body faces and defining equally-inclined lateral faces of isosceles-trapezoidal shape, the base face of each intermediate body resting over a respective central body face, pivot means pivoting the center of the base face of each intermediate body to the center of a respective central body face, said intermediate bodies rotatable relative to said central body to a position in which each edge of the base face of said intermediate body coincides with a respective edge of said central body, as many external bodies as there are lateral faces of said intermediate bodies, each external body being of tetrahedron shape forming a pair of base surfaces and a pair of lateral faces, said base surfaces being inclined relative to each other and meeting at a common straight edge, said straight edge being positioned over a respective one of each edge of the central body in said rotated position of said intermediate bodies with the two base faces of each external body respectively engaging over a pair of lateral faces defined by a pair of adjacent intermediate bodies, respectively, said lateral faces of said external bodies being co-planar with the respective lateral faces of adjacent intermediate bodies in said rotated position, and a circular slideway system slidably connecting each external body rotatably onto the corresponding pair of adjacent intermediate bodies, each circular slideway system being coaxial with a respective pivot means of said intermediate bodies on said external body and including circular groove segments and projections slidably retained in said groove segments and formed at the lateral faces of said intermediate bodies and on said base surfaces of said external bodies, each external body being capable of rotation with respect to said central body about the pivot axis of either one of two adjacent intermediate bodies.

4,500,091

GAME BOX

Edward Rovsek, 1822 Heights St., P.O. Box 21, Brooklyn, Mich. 49230

Filed Mar. 16, 1984, Ser. No. 590,394
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—269 **14 Claims**



1. In combination, an elongated game holder box having a cover mountable upon a support and adapted to store a plurality of game markers, chips or tokens;
an elongated flexible strip of rectangular shape overlying said support adapted to mount said markers selectively over its surface during playing of a game;
said strip at one end projecting into said box along its length and secured thereto;
the other end of said strip being adapted for grasping on opposite sides forming an elongated chute when said sides are elevated above the box, the markers sliding and flipped into said box.

4,500,092

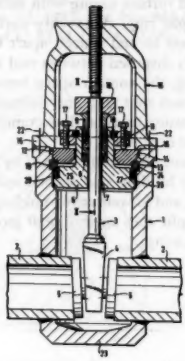
VALVE COVER SEALING ARRANGEMENT

Vilho Uomala; Kjell Sandström, and Jorma Matilainen, all of Pietarsaari, Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Mar. 28, 1983, Ser. No. 479,340
Claims priority, application Finland, Apr. 7, 1982, 821224
Int. Cl.³ F16J *15/30*; F16K *31/44, 41/02*
U.S. Cl. 277—12 **7 Claims**

1. A valve comprising a valve housing with a detachable cover, at least one sealing member between said housing and said cover and supporting means for compressing said sealing member and for keeping it in place, said sealing member being preformed to a form corresponding substantially to the form of

said member under valve operation, said sealing member being kept under a compression load between said cover and said



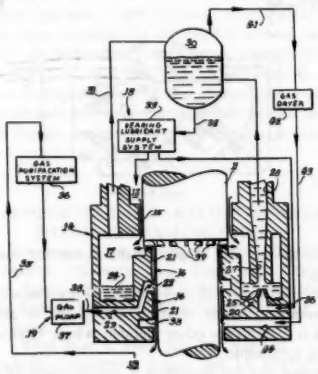
valve housing and being made of a material allowing elastic compression of said sealing member with at least 5%.

4,500,093

SHAFT SEAL SYSTEM

Davorin D. Kapich, Carlsbad, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Aug. 27, 1982, Ser. No. 412,110
Int. Cl.³ F16J *15/56*
U.S. Cl. 277—15 **5 Claims**



1. In a shaft seal system for isolating two regions of different fluid mediums between which a shaft extends, said system including a seal housing defining an annular land and an annular labyrinth facing the shaft, said land being spaced axially toward a selected one of said regions from said labyrinth, said seal housing further defining a fluid collection cavity for communicating with the space between said land and the shaft and the space between said labyrinth and the shaft, first means for introducing a first fluid compatible with the fluid in said selected one of said regions into the space between said land and the shaft in a manner to form a fluid seal therein and effect entry of said first fluid into said collection cavity, second means including gas purification means and gas pumping means for introducing a second gaseous fluid compatible with the fluid in the other of said regions into the space between said labyrinth and the shaft in a manner to normally form a fluid seal therein and effect entry of said second fluid into said collection cavity and prevent ingress of said first fluid into said other region through said space between said labyrinth and the shaft, means for removing fluids from said collection cavity,

a fixed captive volume separator adapted to receive a mixture of the first and second fluids from said means for removing fluids from said collection cavity and to separate the fluids from each other,

a dryer connected to said separator for drying the second gaseous fluid,

means for introducing the dry second gaseous fluid from said gas dryer into the space between said labyrinth and said shaft, and

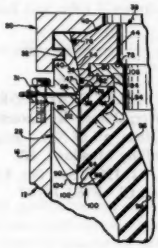
passive pumping means associated with said shaft for effecting passage of said dried gaseous fluid from said means for introducing the dry second gaseous fluid into said space between said labyrinth and said shaft in a manner to prevent ingress of said first fluid into said other region in the event said gas pumping means becomes disabled.

4,500,094

HIGH PRESSURE ROTARY STRIPPER

Morris S. Biffle, 2609 Country Club Dr., Midland, Tex. 79701

Filed May 24, 1982, Ser. No. 381,158
Int. Cl.³ F16J *15/56*; F21B *33/03*
U.S. Cl. 277—31 **18 Claims**



1. In an RBOP **10** having a relatively stationary main body **12** adapted to be affixed to the upper end of a cased borehole, a central passageway **71** formed through the body, so that a rotatable driving member can extend through the passageway and into a borehole; the improvement comprising:

a rubber stripper assembly **30** having a flange **36** at the upper end thereof, and a stripper rubber **56** at the lower end thereof, said stripper assembly is rotatable respective to said main body, said flange has opposed faces **78, 82** and is spaced from an upwardly directed annular surface **86** to form an outwardly opening groove **86, 106, 82**; a medial circumferentially extending sidewall **62** of said stripper rubber is spaced below said annular surface **86**; an axial passageway **96, 98** formed through said stripper assembly for slidably receiving a driving member **71** therethrough;

a bushing **38** having an annular groove **78, 80, 82** within which said flange **36** is rotatably received in low friction relationship therewith;

said bushing **38** has a lower downwardly directed annular face **46** against which said annular surface **86** of said stripper assembly bears when the stripper is thrust uphole;

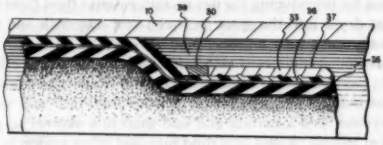
means mounting said bushing **44** in fixed relationship respective to said main body, said central passageway **62, 90** of said main body includes a bearing surface against which said sidewall **62** and **90** of said rubber bears and thereby forms a radial bearing.

4,500,095

INFLATABLE OIL WELL HOLE PLUG WITH REINFORCING WIRES

Robert C. Schisler, and George W. Eisenzimmer, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1983, Ser. No. 548,391
Int. Cl.[3] F16J 15/46
U.S. Cl. 277—34 6 Claims



1. An inflatable packer element, comprising a first annular shoe means;

a second annular shoe means axially spaced from said first shoe means;

an inflatable bladder means connected between said first and second shoe means, and including a reinforcing means; and

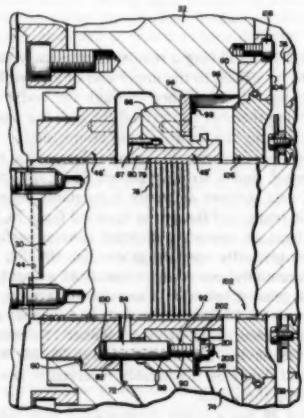
said reinforcing means comprising a series of inline steel cables spaced parallel with the center line of said bladder and having their ends securely fastened to said first and second shoe means, respectively, said series of inline parallel steel cables being embedded in an elastomeric composition over an elastomeric tube and having a cover of a tough elastomer.

4,500,096

TURBINE SHAFT SEAL ASSEMBLY

Alan H. Tuttle, Andover; James K. Leonard, Wellsville, and Henry J. Dlugosz, Olean, all of N.Y., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Feb. 22, 1983, Ser. No. 468,348
Int. Cl.[3] F16J 15/48
U.S. Cl. 277—53 23 Claims



1. In an overhung turbine having a rotor, a rotating rotor shaft, a non-split turbine casing for housing the rotor and the overhung end of the rotor shaft, and a bearing case disposed adjacent the turbine casing for supporting the shaft, said turbine casing having a gland exhaust duct and an opening at one end through which the overhung end of the shaft extends, a seal assembly for plugging the annular zone defined by said shaft and that portion of said turbine casing in the vicinity of said opening, comprising:

(a) a first split ring, removably carried by the turbine casing adjacent said rotor, sealingly disposed between said rotor shaft and said turbine casing with said annular zone;

(b) a second split ring, removably carried by the turbine casing adjacent to and spaced apart from said first split ring, sealingly disposed between said rotor shaft and said turbine casing, the annular space between said first split ring and second split ring and defined by said shaft and said turbine casing being in flow communication with said gland exhaust duct; and

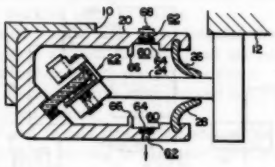
(c) holding means, removably carried by said turbine casing, for releasably holding said second split ring against said first split ring and for releasably holding said first split ring and second split ring against axial movement relative to said turbine casing.

4,500,097

SEAL DEVICE IN DISPLACEMENT MEASURING INSTRUMENT

Hitoshi Sakamoto, Kashiwa; Seiji Sakagami, and Shigeru Nagashima, both of Kawasaki, all of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1984, Ser. No. 572,320
Claims priority, application Japan, Jan. 27, 1983, 58-11656; Jan. 27, 1983, 58-11657; Jan. 27, 1983, 58-10184[U]
Int. Cl.[3] G01B 5/02; F16J 15/32, 15/40
U.S. Cl. 277—59 18 Claims



1. A seal device in a displacement measuring instrument, comprising:

a hollow case formed with an opening along a moving line of one member whose relative movement is detectable, which is fixed to the other member whose relative movement is detectable;

a connecting rod for imparting a displacement of said one member to a displacement detecting mechanism housed in said hollow case through the opening;

seal members disposed at opposite sides of said opening of the hollow case, for shielding a penetrating portion of said connecting rod;

at least one liquid receiving groove extending along said opening and provided at least at one side of the inner surface of said hollow case;

at least one liquid-proof bank provided between said liquid receiving groove and said displacement detecting mechanism;

at least one liquid drain hole communicating with the outside of said hollow case and provided in the bottom of said liquid receiving groove; and

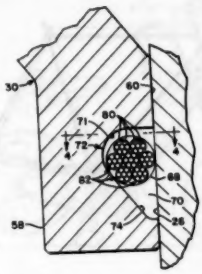
at least one filter provided in said liquid drain hole for excluding dust intruding from the outside.

4,500,098

GAS SEAL FOR ROTATING COMPONENTS

Ernest W. Wilcox, Lake Park, and Jack W. Wilson, Jr., West Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1983, Ser. No. 564,448
Int. Cl.[3] F16J *15/34, 15/40*
U.S. Cl. 277—170 4 Claims



1. A seal assembly comprising;

a first component adapted to rotate about an axis and including means defining a radially extending annular surface disposed about said axis of rotation;

a second component interconnected to said first component and adapted to rotate therewith at the same speed about the same axis of rotation, said second component comprising wall means adjacent said annular surface, said wall means defining a substantially frusto-conical surface coaxial with said annular surface defining an annular seal compartment therebetween; and

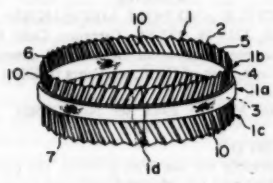
a free length of flexible wire rope, said flexible wire rope comprising a plurality of wire filaments twisted together, said rope disposed in said annular compartment and extending once substantially completely around said compartment in substantially continuous contact with both said annular surface and said frusto-conical surface, wherein during rotation of said seal assembly said wire rope is pressed into sealing relationship against said annular and frusto-conical surfaces by centrifugal forces.

4,500,099

ELASTIC SUPPORTING AND SEALING MEMBER WITH THERMAL FOAMING STRIP

Katsutoshi Kitagawa; Kiyoshi Isogai; Nobuo Ohmori; Naka Takita; Makoto Okamoto; Itsuo Koga, all of Toyota, and Kazuo Ito, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Chuo Spring Co., Ltd., Nagoya, both of, Japan

Filed Mar. 4, 1983, Ser. No. 472,183
Claims priority, application Japan, Jun. 15, 1982, 57-103168
Int. Cl.[3] F16J *15/12*
U.S. Cl. 277—228 15 Claims



1. An elastic supporting and sealing member for mutually supporting a first body with respect to a second body and for sealing a gap between said first body and said second body, the member comprising:

a first and a second strip shaped portion of wire net; and

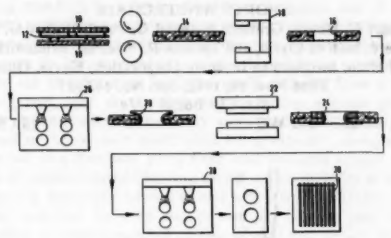
a strip shaped piece of thermal foaming material disposed between said first and said second wire net portions to extend in the longitudinal direction of said first and said second strip shaped wire net portions, said first and said second wire net portions extending laterally beyond the lateral extent of said strip shaped piece of thermal foaming material on opposite sides thereof so as to provide laterally extreme portions where said first and second wire net portions oppose one another without the interposition of said piece of thermal foaming material.

4,500,100

CYLINDER HEAD GASKET

Rudolf Bindel, Grafenberg, and Eugen Ruoff, Urach, both of Fed. Rep. of Germany, assignors to Elring Dichtungswerke GmbH, Fellbach, Fed. Rep. of Germany

Division of Ser. No. 536,909, Sep. 28, 1983,. This application Jul. 24, 1984, Ser. No. 633,800
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1982, 3240295
Int. Cl.[3] F16J *15/12;* B65D *53/00*
U.S. Cl. 277—235 B 20 Claims



1. A cylinder head gasket having at least one plate of soft material and at least one combustion chamber opening:

said plate of soft material consisting predominantly of inorganic fibers connected by binding means and including free OH groups, wherein part of the fibers or filling materials extend up to the surface of the plate of soft material, said plate of soft material being mixed with polymer impregnation means;

said polymer impregnation means including a first impregnating material application of a first polysiloxane containing reactive hydrogen groups for reaction with the free OH groups of the fibers and filling materials and a second impregnating material application of a second polysiloxane of a higher degree of polymerization which polymerizes with itself as well as with the reactive hydrogen groups of the polysiloxane of the first impregnating material, the second polysiloxane forming a stable siloxane structure having mre branches than the first polysiloxane.

4,500,101

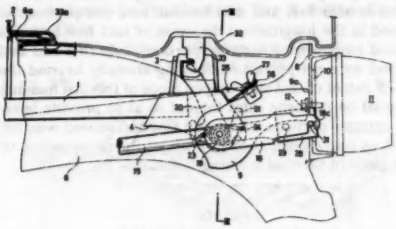
REAR FENDER STRUCTURE FOR MOTORCYCLES

Masanori Aoki, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 304,468, Sep. 22, 1981, abandoned. This application Dec. 22, 1983, Ser. No. 563,889
Claims priority, application Japan, Sep. 22, 1980, 55-131914; Sep. 22, 1980, 55-131915
Int. Cl.[3] B62J *15/00*
U.S. Cl. 280—152.1 21 Claims

1. A rear fender structure for use in a motorcycle comprising; a rear fender, a support shaft supported to a motorcycle frame body, an upper member comprising a seat or rear box

positioned to overlap with said rear fender, and interlocking means provided between said rear fender and said upper member, said rear fender being pivotally secured at an intermediate portion thereof to said support shaft and detachably engaged with said upper member through said interlocking means.

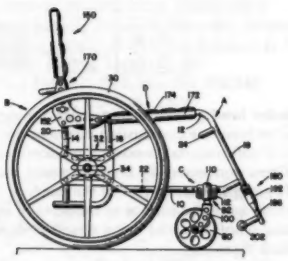


4,500,102

SPORTS WHEELCHAIR

Gilbert E. Haury, Grafton; Nathalal G. Patel; Walter G. Lockard, both of Elyria, and Thomas R. Wiatrak, Brunswick, all of Ohio, assignors to Invacare Corporation, Elyria, Ohio

Filed Nov. 16, 1982, Ser. No. 442,037
Int. Cl.³ B62M *1/14*
U.S. Cl. 280—242 WC **28 Claims**



1. A wheelchair which is adapted for both sporting activities and daily use, the wheelchair comprising:

a frame assembly;

supporting means for supporting a user, the supporting means being operatively connected with the frame assembly;

a pair of rear wheels;

an adjustable rear wheel mounting means for selectively mounting each of the rear wheels to the frame assembly in one of a plurality of positions, the rear wheel mounting means being operatively connected with the frame assembly, the rear wheel mounting means including:

a mounting plate including a plurality of slots which are elongated along parallel slot axes;

an axle receiving assembly which is selectively positionable in the slots at a selectable position along the slot axis;

a stop means for stopping the axle receiving assembly from shifting along the slot axis;

a pair of front wheels; and,

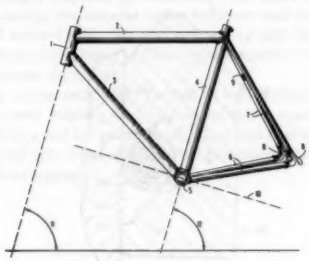
a front wheel mounting means for mounting each of the front wheels to the frame assembly.

4,500,103

HIGH EFFICIENCY BICYCLE FRAME

Gary G. Klein, 207 B S. Prairie Rd., Chehalis, Wash. 98532

Continuation of Ser. No. 658,620, Feb. 17, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,141
Int. Cl.³ B62K *19/06*
U.S. Cl. 280—281 R **7 Claims**



1. In a bicycle having wheels of greater than 25 inches diameter and a frame of the type including a tubular top tube having front and rear ends, a tubular seat tube having top and bottom ends with the top end secured to the rear end of said top tube, a tubular head tube having top and bottom ends with the top end secured to the front end of said top tube, a tubular down tube having top and bottom ends with the top end secured to the bottom end of said head tube, a pair of chainstay tubes having front and rear ends, two or more bridged seatstay tubes having top and bottom ends with the top ends secured to the top end of said seat tube, a bottom bracket secured to the lower ends of said seat and down tubes and the forward ends of said chainstay tubes, two rear fork ends secured to the rear and lower ends, respectively, of said chainstay and seatstay tubes, the head tube being at a ground angle of between 60 to 80 degrees and the seat tube to ground angle is between 58 and 85 degrees when the appropriate front fork and wheels are attached and rest on the ground, the mass of the frame without fork or other equipment is less than 5 pounds, the improvement wherein said top, down, seat, chainstay tubes and seatstay tubes have diameter to wall thickness ratios of less than 50, and are of a diameter and wall thickness such that said frame has a torsional rigidity between the said head tube and bottom bracket of at least 67 pounds*force* feet per degree of deflection with the said torque being applied to the bottom bracket along an axis normal to the axis of the said seat tube and normal to the axis of the said bottom bracket, and a lateral bending rigidity of at least 120 pounds*force* per inch of delfection measured at the said rear fork ends of the bicycle frame with an axle installed, with the said head tube clamped immovably in a horizontal position and the said bottom bracket supported but not otherwise restrained, said force being applied and deflection measured in a direction normal to the plane of the bicycle frame and along the axis of the rear axle.

4,500,104

BICYCLE AND DOLL MECHANISM

Elliot A. Rudell, 2215 W. 237 St., Torrance, Calif. 90501; Michael E. Shumate, Manhattan Beach, and Joseph S. Cernansky, Gardena, both of Calif., assignors to Elliot A. Rudell, Lawndale, Calif.

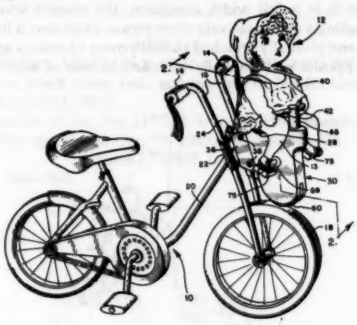
Filed Mar. 16, 1983, Ser. No. 475,969
Int. Cl.³ B62K *3/00*
U.S. Cl. 280—289 D **41 Claims**

1. A doll assembly for use with a cycle, the cycle having handlebars and a front wheel; the front wheel coupled to be turned by the handlebars; the doll assembly simulating a second rider on the cycle and comprising:

a doll with arms and motile legs;

a set of miniature handlebars, doll seat structure, and crank

means, the crank means coupled to be rotated by and in the same rotational direction as the cycle's front wheel; the hands of the doll being fastened to the miniature handlebars and the feet of the doll being fastened to the crank means;



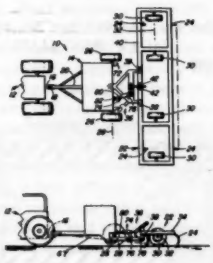
the doll appearing to be steering and pedalling in concert with the actions of the rider when the cycle is being ridden.

4,500,105

AGRICULTURAL IMPLEMENT HITCH ASSEMBLY

Cecil B. Machnee, Yorkton, Canada, assignor to Morris Rod-Weeder Company, Limited, Yorkton, Canada

Filed May 16, 1983, Ser. No. 495,275
Claims priority, application Canada, Jun. 15, 1982, 405169
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—468 **19 Claims**



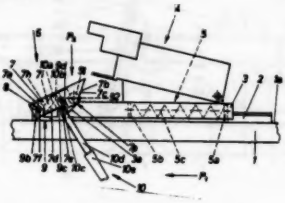
1. A hitch assembly for use in connecting a primary wheeled unit to an intermediate wheeled unit in a train of units, said intermediate unit including a pair of ground-engaging wheels rotatable about a first transverse axis, and said primary unit including a frame mounting at least one ground-engaging element and a pair of ground-engaging wheels rotatable about a second transverse axis, said assembly comprising: first link means extending below said frame; second link means extending above said frame; drawbar means pivotally connected at one end to said first link means and having connection means at the other end thereof for pivotable connection to said intermediate unit at a point which is both on or closely adjacent to said first axis and is located on or closely adjacent to a reaction line drawn from a connection point for said intermediate unit in the train to the ground-engagement area of said element; and third link means pivotally connected to said drawbar means and to said second link means for fixing the angular relation between said frame and said drawbar means.

4,500,106

SKI BRAKE

Josef Svoboda, Schwechat, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Mar. 30, 1982, Ser. No. 363,741
Claims priority, application Austria, Apr. 1, 1981, 1510/81
Int. Cl.³ A63C *7/10*
U.S. Cl. 280—605 **14 Claims**



1. A ski brake, comprising a braking bar which is supported for pivotal movement about a first axis extending approximately perpendicular to the longitudinal axis of the ski, has two braking mandrels, is made of a bent wire material, and can be pivoted about said first axis by a pedal between a braking position in which the two braking mandrels project below the running surface of the ski and a retracted position in which the braking mandrels lie substantially above the upper side of the ski, said pedal being supported for pivotal movement about a second axis which extends at approximately a right angle with respect to the longitudinal axiis of the ski and being supported on the ski at a location spaced a small distance from a ski binding part, said ski binding part including a guide plate which is longitudinally movably supported on a guide rail secured to the ski, said guide plate being movably along said guide rail in a direction away from said first axis against the force of resilient thrust-blancing means which includes at least one spring, said pedal having an end which is spaced from said second axis and faces an end of said ski binding part, and including a roller supported on one of said end of said pedal and said end of said ski binding part for rotation about a transverse horizontal axis, said roller being operatively engageable with a surface which is provided on the other of said end of said pedal and said end of said ski binding part and which is inclined upwardly in a direction toward said ski binding part; wherein said roller is provided on said pedal and has its circumferential surface tangential to the underside of said pedal.

4,500,107

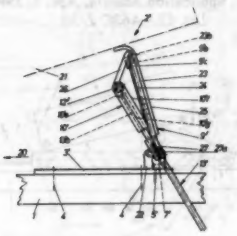
SKI BRAKE

Josef Svoboda, and Emilie Szabo, both of Schwechat, Austria, assignors to TMC Corporation, Baar, Switzerland

Division of Ser. No. 200,121, Oct. 24, 1980, Pat. No. 4,371,187.
This application Aug. 19, 1982, Ser. No. 409,481
Claims priority, application Austria, Oct. 25, 1979, 6933/79
Int. Cl.³ A63C *7/10*
U.S. Cl. 280—605 **9 Claims**

1. In a ski brake mountable on a ski, having pedal means supported on a base for pivotal movement about a first axis between a braking position and a retracted position, and having two braking arms which each have a first section which is rotatably supported on said pedal means and extends generally perpendicular to said first axis, a second section which is radially offset from and extends parallel to said first section and a third section which connects said first and second sections, rotation of each said braking arm first section effecting movement of said second section thereof between a first position spaced laterally outwardly of an adjacent side wall of the ski and a second position located laterally inwardly of said side wall, and including resilient means for yieldably urging said pedal means toward said braking position, the improvement comprising wherein said first sections of said braking arms are supported for axial movement relative to said pedal means, and

including means for effecting axial movement of said first sections relative to said pedal means as said pedal means moves between said braking and retracted positions and means for effecting rotation of said first section of said braking arms



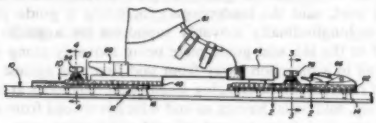
relative to said pedal means in response to relative axial movement therebetween, said second sections of said braking arms moving between said first and second positions as said pedal means moves between said braking and retracted positions, respectively.

4,500,108

CONVERTIBLE SKI DEVICE

Luvern C. Johnson, III, P.O. Box 1725, Pocatello, Id. 83204

Filed Feb. 16, 1983, Ser. No. 467,144
Int. Cl.³ A63C *9/00*
U.S. Cl. 280—614 **8 Claims**



1. In combination with a ski including front and rear end portions as well as front and rear boot binding mounting areas, a rear boot heel binding mount supported on said ski in said rear mounting area, a front boot toe binding mount supported on said ski in said front mounting area, rear ski binding mounting structure supported from said rear mount, a rear downhill boot binding supported from said rear ski binding mounting structure, means mounting said rear ski binding mounting structure from said rear mount for shifting thereon between a forward active position and a rear inactive position; front ski binding mounting structure mounted on said front mount, downhill and cross-country ski boot toe bindings supported from said front ski binding mounting structure in horizontally spaced apart positions thereon and with said downhill and cross-country toe bindings opening in opposite directions, said front ski binding mounting structure and said front binding mount including coacting structure releasably supporting said front ski binding mounting structure from said front binding mount for reverse positioning thereon.

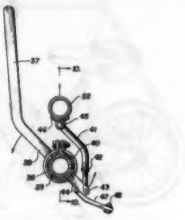
4,500,109

WHEELCHAIR WIDTH ADJUSTER

Frank Volin, Columbia, S.C.

Filed Dec. 15, 1982, Ser. No. 450,068
Int. Cl.³ B62B *11/00*
U.S. Cl. 280—650 **8 Claims**

1. In a laterally folding wheelchair of the type having a pair of vertical frame sides interconnected by a vertically folding X-frame, the frame sides including fixed horizontal fore-to-aft bars and parallel vertically movable fore-to-aft seat web support bars connected with the top of said X-frame, the improvement comprising a vertically swingable manual lever swiveled on one of the fixed horizontal fore-to-aft bars and being operable in a vertical plane at right angles to the vertical plane of the adjacent frame side of the wheelchair, the manual lever including a comparatively long handle portion which extends upwardly adjacent to the outer side of one vertical frame side of the wheelchair in ready reach of a chair occupant when the chair is in a full width condition, the manual lever further including a comparatively short power extension, a link having one end pivotally attached to said power extension and having its opposite end pivotally attached to one of said vertically



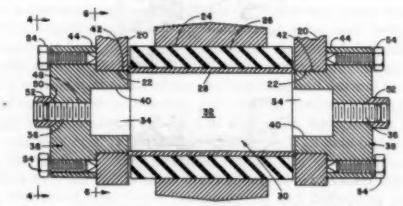
movable fore-to-aft seat web support bars and being bodily movable in a vertical plane in response to movement of said manual lever downwardly by a chair occupant to elevate said seat web support bar, and a substantially rigid stop element secured to said short power extension and projecting beyond one end of the same and being in a common vertical plane with said link and contacting one side of the link to limit downward movement of said manual lever by an occupant of the wheelchair to reduce the width of the wheelchair.

4,500,110

ECCENTRIC ADJUSTMENT FOR VEHICLE AXLE SUSPENSIONS

Fred A. McWhorter, 2134 Kraftmeyer Dr., Davenport, Iowa 52803, and William L. Bates, 1731 - 18th St., Bettendorf, Iowa 52722

Filed Apr. 13, 1983, Ser. No. 484,725
Int. Cl.³ B60G *11/10*
U.S. Cl. 280—680 **8 Claims**



1. In a vehicle axle suspension including a fore-and-aft walking beam and a transverse axle housing having a pair of spaced apart ears straddling the walking beam, said ears respectively having circular openings of like diameter therein and coaxial on a transverse axis, the improvement comprising interconnecting structure between the walking beam and axle housing, including means carried by the walking beam and providing a pair of opposite, transversely coaxial cylindrical portions of like diameter projecting respectively at opposite sides of the walking beam and respectively into the axle housing ear openings, said portions being of lesser diameter than said openings, a pair of adjustment members respectively cooperative with the cylindrical portions and openings for mounting the axle housing on the walking beam, each adjustment member having an internal cylindrical bore rotatably receiving the adjacent cylindrical portion and an exterior cylindrical surface rotat-

ably receiving the adjacent ear opening, the axes of the bore and surface being eccentric to each other whereby angular movement of an adjustment member causes the axle housing to shift relative to the walking beam, and means for securing the adjustment in any selected position of adjustment.

4,500,111

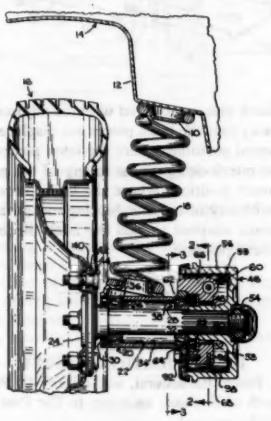
SUSPENSION ASSEMBLY FOR A WHEEL AND BRAKE

Ji Y. Woo, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 217,724, Dec. 18, 1980, abandoned. This application Oct. 19, 1983, Ser. No. 543,571

Int. Cl.³ B60T *1/06*

U.S. Cl. 280—688 **3 Claims**



1. A combined wheel mounting and brake assembly for a vehicle having a small lightweight frame with front wheels associated with disc brakes and rear wheels associated with drum brakes, comprising a support fixedly engaging the vehicle frame via a spring engaging the support and the vehicle frame, said support defining an opening extending axially therethrough, and an axle rotatably disposed within said support opening via a pair of bearings carried within said support opening at substantially opposite ends of said support opening, said axle including a first portion at one end of said support outside said one end support opening, said first portion extending radially outwardly of said support opening and releasably mounting one of the rear wheels to said axle, said axle including a second portion at the other end of said support opening, said second portion extending radially outwardly of said support opening and having an axially extending outer rim, said rim substantially defining a cavity for receiving one of the drum brakes which is disposed adjacent said support other end, the one drum brake being operable to brake the rear wheel via said axle, said axially extending rim defining a surface engageable with the one drum brake and said surface defines a diameter dimension which is less than a diameter dimension for the radial outer periphery of said first portion, said second portion defining an inner axially extending boss engageable with said axle and cooperating with one of said pair of bearings to retain the latter within the support opening, said second portion being releasably coupled to said axle via a nut, and said nut cooperates with said axle when said second portion is coupled thereto and cooperating with the one bearing to retain the other of said pair of bearings within the support opening, whereby said pair of bearings are carried within the support opening to one side of the rear wheel in the direction of said second portion.

4,500,112

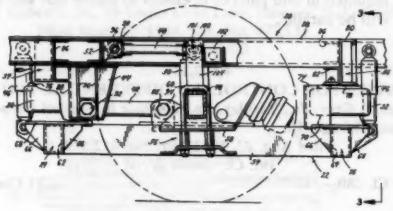
WIDE BASE AIR SPRING SUSPENSION SYSTEM

John E. Raidel, Rte. 1, Box 400-M, Springfield, Mo. 65804

Division of Ser. No. 266,006, May 21, 1981, abandoned. This application Jun. 22, 1983, Ser. No. 506,697

Int. Cl.³ B60G *3/18*

U.S. Cl. 280—693 **11 Claims**



11. A vehicle suspension assembly for supporting a vehicle chassis on a steer axle, said chassis having a frame comprised of a plurality of longitudinal rail members extending along the undercarriage thereof, said suspension including an integral stool shaped axle seat for mounting to the axle, the axle seat having an outrigger extension member extending upwardly and outwardly from the base thereof, an upper spring bracket for mounting to the chassis and having an outrigger extension member extending out from the chassis, each of said outrigger members having means to mount an air spring, an air spring mounted to and extending between said outrigger members and outside the longitudinal rail frame members, a hanger assembly for mounting to and extending downwardly from a rail frame member and forwardly of the axle seat, each of said axle seat and hanger assembly having means to pivotally connect two torque rods, two torque rods pivotally connected to and extending between said axle seat and said hanger assembly, the axle seat having means to pivotally mount a sway bar, a sway bar pivotally mounted to and extending between the axle seat and a rail frame member, the axle seat having means to mount two shock absorbers, and two shock absorbers for extending between the axle seat and a rail frame member.

4,500,113

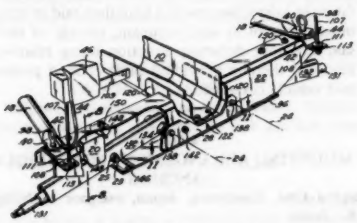
VEHICLE SUSPENSION SYSTEM

Denny B. Law, San Marcos, Calif., assignor to Unique Functional Products, San Marcos, Calif.

Division of Ser. No. 327,257, Dec. 3, 1981,. This application Aug. 1, 1983, Ser. No. 518,945

Int. Cl.³ B60G *11/22*

U.S. Cl. 280—716 **14 Claims**



7. In a two wheel trailer, the improvement in mounting of said wheels, comprising:

(a) a swing axle extending laterally of the trailer at either side having at one end one of said wheels mounted thereon and a pivotal mounting on said trailer for the other end of each axle on opposite sides of said trailer, said pivotal mountings being oriented so that said axles will pivot about axes

parallel to each other and parallel to the longitudinal axis of said trailer, and

(b) a housing extending laterally of said trailer and a pair of vertical plates separate from and abutting forward and rear sides of said housing and said pivotal mountings for the other ends of said axles being provided by precision drilled pairs of openings in said plates and precision bolts mounted in said pairs of openings to insure that said axes will be parallel.

4,500,114

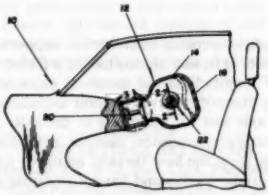
DEVICE FOR CONTROLLED DIFFERENTIAL FLOW

James T. Grey, Jr., Yardley, Pa., assignor to Thiokol Corporation, Chicago, Ill.

Filed Aug. 27, 1982, Ser. No. 412,339

Int. Cl.³ B60R *21/08*

U.S. Cl. 280—742 **21 Claims**



1. An inflatable structure having a folded, deflated condition and an inflated, expanded condition for restraining the movement of a vehicle occupant relative thereto during a collision and having flexible, fluid impermeable walls defining a confinement for a pressurizing fluid introduced interiorly thereof for expanding said structure, a portion of said structure being fluid permeable permitting passage of fluid into and out of said confinement and providing rebound protection for said occupant under restraint when said occupant impacts said structure during the collision of said vehicle, said portion including a fluid permeable fabric having a filamentous surface formed on at least one side, said filamentous surface comprising a plurality of extensile, flexible filaments anchored at one end to said fabric and having free opposite ends adapted to be extended in mutual, substantially parallel relation from said surface, generally perpendicular to said fabric by said fluid permeating said fabric and flowing through said filamentous surface in a direction tending to inflate said structure, passage of said fluid into said structure being relatively unhindered; and,

said filaments collapsible onto said fabric by fluid flowing through said filamentous surface and permeating said fabric in a direction tending to deflate said structure, upon impact thereof by said occupant, passage of said fluid in said structure deflating direction being relatively more hindered thereby providing said rebound protection for said vehicle occupant.

4,500,115

MOUNTING ARRANGEMENT FOR THROUGH ANCHOR

Katsuyasu Ono, Kanagawa, Japan, assignor to NSK-Warner K.K., Japan

Filed Nov. 24, 1982, Ser. No. 444,503

Claims priority, application Japan, Nov. 24, 1981, 56-174382[U]

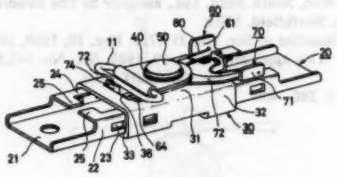
Int. Cl.³ B60R *21/10*

U.S. Cl. 280—808 **11 Claims**

1. A device adapted to mount, on an automobile body, a through-anchor which permits the webbing of an automobile seat belt to extend therethrough, said device comprising:

an adjustable anchor carrying the through-anchor fixedly secured thereon;

a base to be fixedly mounted on the automobile body and equipped with a plurality of interlocking means which are arranged in pairs along two mutually-parallel lines with a predetermined interval between each two adjacent interlocking means on each of the lines;



a pair of latch pieces provided with the adjustable anchor in such a way that the latch pieces are displaceable between engagement positions where the latch pieces are engaged with the interlocking means in any of the pairs and non-engagement positions where the latch pieces are not engaged with any of the interlocking means; and

biasing means adapted to bias the latch pieces toward the engagement position.

4,500,116

IDENTIFICATION MATTER

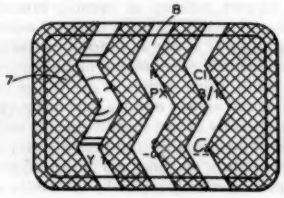
Berkeley M. Ferro, Barnehurst, and Aubrey D. Walker, North Harrow, both of England, assignors to The Post Office, London, England

Continuation of Ser. No. 4,054, Jan. 16, 1979, abandoned. This application Jul. 14, 1980, Ser. No. 168,151

Claims priority, application United Kingdom, Jan. 18, 1978, 2096/78

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—92 **7 Claims**



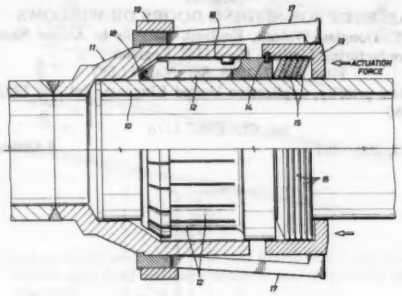
1. An article for establishing personal identity, comprising a substrate carrying identification markings, said substrate having thereon or therein a phosphorescent material comprising a rigid matrix in which there are dispersed two or more organic phosphorescense activators which are unresponsive to visible light and which during and after irradiation with ultraviolet light emit visible phosphorescense, said matrix being transparent to radiation at the excitation and emission frequencies of said phosphorescense activators, said emissions of said phosphorescense activators differing from one another with respect to both wavelengths and lifetime, whereby the total emission of said phosphorescent material after cessation of said irradiation changes from an initial colour representing the combined emissions of said activators to a final colour representing the emission of that activator having the longest phosphorescence lifetime.

4,500,117

PIPELINE CONNECTOR

Ray R. Ayers, and Robert M. Kipp, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 24, 1982, Ser. No. 444,416
Int. Cl.³ F16L 37/00
U.S. Cl. 285—3 **10 Claims**



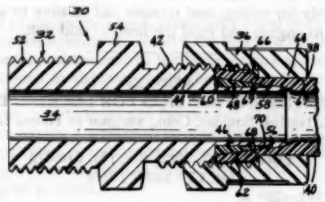
1. A connector for joining a bell-end pipe to a straight-end pipe comprising:
collet wedge fingers encircling the straight-end pipe and insertable into the bell-end pipe;
deformable sealing material at the lateral extremity of the collet wedge fingers;
driving means for pressing the collet wedge fingers and deformable sealing material into sealing engagement with the bell-end pipe; and
locking means attached to the bell-end pipe for maintaining said sealing engagement.

4,500,118

FITTING APPARATUS FOR SOFT TUBING

Brian J. Blenkush, Maple Grove, Minn., assignor to Colder Products Company, St. Paul, Minn.

Filed Dec. 30, 1982, Ser. No. 454,562
Int. Cl.³ F16L 33/00, 33/16, 25/00
U.S. Cl. 285—247 **17 Claims**



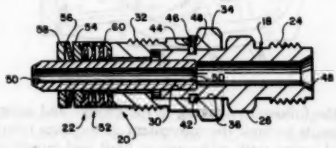
1. A fitting for use withe soft tubing, comprising:
(a) a female member defining an aperture for insertion therethrough of a tubing, said female member having a threaded portion;
(b) a male member defining a tubular portion adapted for insertion into the tubing, said male member including radially extending flange means for preventing the insertion of said tubular portion into the tubing beyond a predetermined distance, said male member including a threaded portion adapted for cooperation with the threaded portion of said female member;
(c) a collar portion slideably mounted on said tubular portion for axial movement on said tubular portion, said collar portion being adapted for insertion at least partially into the tubing; and
(d) a generally radially inwardly projecting collar portion of said female member engaging the outer surface of the tubing, said collar portion of said female member cooperating with said axially slideable collar portion of said male member to retain the tubing in the fitting when a tensile pull is exerted thereon.

4,500,119

FLUID SWIVEL COUPLING

John D. Geberth, Jr., 10 Goose Cove Lane, Ramsey, N.J. 07446

Filed Mar. 21, 1983, Ser. No. 477,131
Int. Cl.³ F16L 27/00
U.S. Cl. 285—276 **1 Claim**



1. A fluid swivel coupling for interconnecting a first fluid conduit and a second fluid conduit, said second fluid conduit having an internal shoulder therein, for rotational movement about their common axis where the fluid flowing therein contains suspended solid particles, said fluid swivel coupling comprising:
(a) a spindle having an axial fluid bore therethrough including means for securing a first end of said spindle to said first fluid conduit;
(b) a stem portion of hard, wear resistant material at the second end of said spindle having an axial fluid bore therethrough axially aligned with the fluid bore of said spindle;
(c) a swivel body having an axial bore therethrough for accepting said spindle coaxially therein including means for threadably engaging said swivel body axially to said second fluid conduit so that an end of said swivel body extends into said conduit;
(d) means for connecting said spindle within the axial bore of said swivel body so that said swivel body rotates on said spindle about their common axis; and
(e) a packing seal for effecting a fluid tight seal between said spindle and said swivel body disposed surrounding the stem portion of said spindle and between the internal shoulder of said second fluid conduit and said end of said swivel body extending into said conduit, so that said packing seal is compressed about said stem portion and between the shoulder of said second fluid conduit and said end of said swivel body to thereby effect a fluid tight seal between said spindle and said swivel body which is adjustable by adjustment of the threadable engagement between said swivel body and said second fluid conduit.

4,500,120

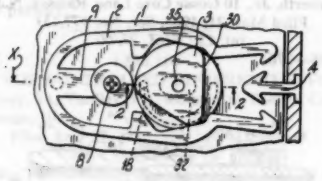
CATCH OR LOCK

Terence E. Ridgewell, Gravesend, and Keith Vallis, Windsor, both of England, assignors to Kimberly-Clark Limited, Kent, England

Filed Dec. 22, 1982, Ser. No. 452,142
Int. Cl.³ E05C 19/08
U.S. Cl. 292—19 **8 Claims**

1. A lock comprising a casing, a rotatable cam mounted to the casing, means of the cam for accepting a key, a latch comprising at least one latch arm including a hasp engaging latching means, the latch being in co-operable relationship with the cam, a hasp with which each latching means is engageable for locking, the arrangement being such that on insertion of the key into the lock the cam may be rotated to disengage the latch from the hasp, two abutments forming stop means for deter-

mining releasing and locking positions of said cam, the key being insertable or removable when the cam is in the locking position, wherein a groove and follower cooperatively couple the casing and cam, the groove having a first and second portion, said first portion having a ramp with a raised end forming one of said abutments at an end of said second portion, another of said abutments formed at another end of said second



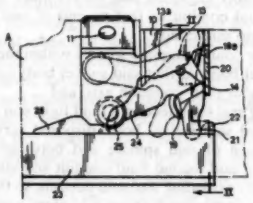
portion, the follower engaging in the groove and acting with the abutments to limit the movement of the cam relative the casing and acting with said ramp to limit said movement in a direction from said first portion to said second portion and not in reverse of said direction, an end of said first portion remote from said second portion defining a first supplementary releasing position of the cam, the key being insertable or removable from said lock at said first supplementary releasing position.

4,500,121

DEVICE FOR STOPPING AND HOLDING IN THE OPEN POSITION A SLIDING DOOR ON A VEHICLE

Giuseppe Ferrero, Cherasco, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Jul. 15, 1983, Ser. No. 514,125
Claims priority, application Italy, Jul. 15, 1983, 53517/82[U]
Int. Cl.³ E05C *19/04*
U.S. Cl. 292—79 **1 Claim**



1. A device for stopping and holding in the open position a sliding door on a vehicle comprising:

a sheet metal support fixed to the door,

a V-shaped lever, pivoted at the vertex of the V on a pin carried by said support and having a first and a second arm,

a roller rotatably mounted at the free end of said first arm of the lever,

a guide rail,

a spring interposed between said lever and said support, said spring causing said lever to rotate on said pin in order to press said roller on said rail,

a projection carried by said guide rail, said projection having a substantially triangular profile with two slopes inclined in opposite directions,

an end stop carried by said rail, said end stop cooperating with said second arm of said V-shaped lever,

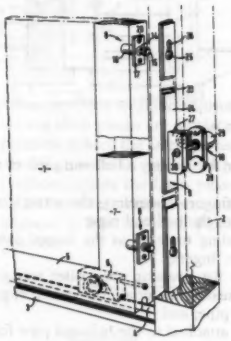
the distance between said triangular projection and said end stop being such that in the last portion of the opening stroke of the door one of the slopes of said projection causes said lever to rotate on said pin against the action of said spring and that in the open position of the door the free end of said second area of the lever abuts against said stop and the roller carried by the free end of said first arm abuts against the other slope of said triangular projection which is inclined towards said end stop.

4,500,122

FASTENER FOR SLIDING DOORS OR WINDOWS

Jack E. Douglas, Walsall, England, assignor to Arthur Shaw Manufacturing Limited, Rose Hill, England

Filed Jul. 7, 1983, Ser. No. 511,587
Claims priority, application United Kingdom, Jul. 24, 1982, 8221460
Int. Cl.³ E05C *1/16*
U.S. Cl. 292—161 **8 Claims**



1. A fastener for sliding doors, windows or the like comprising:

a receivor assembly including two overlying rails, one of said rails being a retainer rail which is slidable relative to the other of said rails, said receivor assembly further including aligned openings in said overlying rails;

a bolt assembly including a headed bolt and a spring means for spring loading said headed bolt towards said aligned openings in said receivor assembly; and

a handle means operatively connected to said receivor assembly for sliding said retainer rail relative to said other rail to engage and hold the head of said bolt.

4,500,123

APPARATUS AND METHOD FOR LOCKING DOORS

Orville L. Harms, Boulder, Colo., assignor to Timpte Industries, Inc., Denver, Colo.

Filed Jul. 22, 1983, Ser. No. 516,473
Int. Cl.³ E05C *19/18*
U.S. Cl. 292—259 A **19 Claims**

1. Apparatus for securing a pair of doors in a closed position comprising:

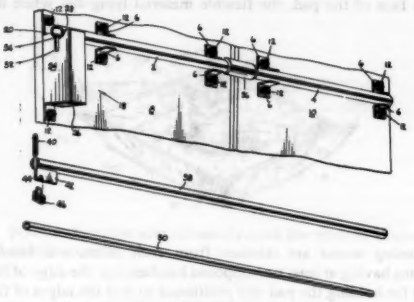
first and second doors mounted to fixed supports so that said first and second doors can be moved to an opened or closed position;

first and second hollow elongated bodies respectively fixed to the outer surfaces of each of said first and second doors so that said first and second bodies are in alignment when said first and second doors are in the closed position;

a third hollow elongated body open at each end secured to said first door adjacent to and in operative association with an end of said first body to effectively seal one end of said third body;

a fourth hollow elongated body having a cross-sectional area less than the cross-sectional area of said first and second bodies and a length greater than the length of either of said first and second bodies;

portions of said fourth body being located within said first body, said second body and said third body; and



locking means associated with said fourth body and located within said third body and adjacent said effectively sealed one end.

4,500,124

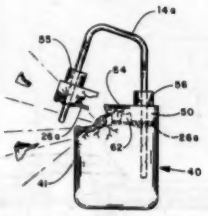
SEAL OF THE PADLOCK TYPE

Allan W. Swift, Denville, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Jan. 13, 1983, Ser. No. 457,235

Int. Cl.³ B05D *33/34*

U.S. Cl. 292—318 **5 Claims**



1. A seal of the padlock type, comprising a seal body having a pair of spaced openings to receive the legs of a shackle, and an elongated metal fastener in the body having spaced apertures positioned in alignment with the body apertures to receive the shackle legs, and shackle engaging means disposed at the apertures, said fastener and the portion of the body above the fastener having a weakened portion disposed between the shackle apertures, whereby excessive tension applied to a shackle leg will cause fracture of the fastener and the body at the weakened portions.

4,500,125

PET LITTER COLLECTING DEVICE

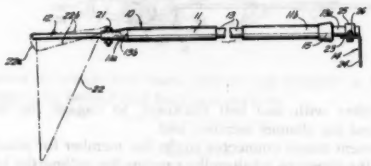
Edward A. Olson, 111 Maolis Ave., Bloomfield, N.J. 07003

Filed Mar. 12, 1984, Ser. No. 588,569

Int. Cl.³ A01K *29/00*

U.S. Cl. 294—1 BA **8 Claims**

1. A pet litter collecting device consisting essentially of a two part receptacle holder and scoop assemblage, said receptacle holder comprising an elongated tubular handle having at one end a fixedly mounted coplanar triangular frame with the remote side of the triangular frame being perpendicular to the axis of said tubular handle, said remote side of the triangular frame joining convergent sides in rounded corners, and said convergent sides terminating in essentially parallel coplanar extensions which are fixedly secured in a flatened end of said tubular handle, the dimensions of said triangular frame being such as to correspond with the perimeter of the open end of standard plastic sandwich bags whereby folding over the bag edge can securely envelope said frame, hook means on said handle at the juncture of said frame and handle for tensionally anchoring a bag edge in engagement with said frame, said hook means being part of the clamping means for fixedly securing said frame extensions to said handle, said scoop comprising an elongated hand grip portion telescopically and detachably fitting within said tubular handle and having at one end thereof



a detachable scoop head, said scoop head supporting an operative element disposed perpendicularly to the hand grip member at one side of the axis thereof, the width of said operative portion being somewhat greater than its height and less than the size of the opening provided by the remote edge of said triangular frame, whereby the operative element of said scoop head, after use, can be received by the bag as the tubular handle and hand grip member are arranged in juxtaposition for carrying purposes.

4,500,126

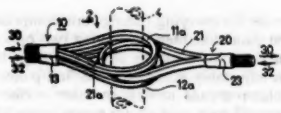
OBJECT-GRIPPING DEVICE AND INDUSTRIAL ROBOT INCLUDING SAME

Yosef Tur-Kaspa, and Ehud Lenz, both of Haifa, Israel, assignors to Technion Research & Development Foundation Ltd., Haifa, Israel

Filed Mar. 23, 1983, Ser. No. 477,867

Int. Cl.³ B66C *1/10*

U.S. Cl. 294—86 R **14 Claims**



1. An object-gripping device particularly useful for gripping thin-wall tubes, comprising:

a first gripping member formed at one end with two spaced loops adapted to partially enclose one side of the object;

a second gripping member formed at one end with a third loop interposed between the two loops of the first gripping member and adapted to partially enclose the opposite side of the object; and

actuator means engaging the opposite ends of the two gripping members and adapted to move them away from each other to cause their loops to grip the object, or towards each other to cause their loops to release the object.

4,500,127

BELT CLAMP FOR CONVEYOR BELTS

Donald H. Van Derlin, P.O. Box 261, North Bend, Oreg. 97459

Filed Sep. 16, 1982, Ser. No. 419,085

Int. Cl.³ B25B *5/04;* **B66F** *19/00*

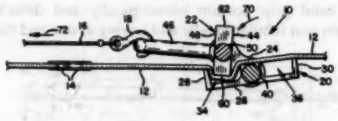
U.S. Cl. 294—104 **10 Claims**

1. A belt clamp for a conveyor belt, comprising:

a channel member having a base wall and a pair of parallel sidewalls defining a channel, the length of the channel member being sufficient to span the width of the belt;

a bar member sized to span the conveyor belt and to fit into said channel together with a thickness of the belt;

connecting means pivotally interconnecting the bar member and the channel member on opposite sides of the belt so that the bar member can rotate about a pair of spaced-apart pivot axes parallel to the sidewalls into said channel,



together with said belt thickness, to engage the belt against the channel member; and

attachment means connected to the bar member for attaching the clamp to a belt-pulling means for pulling the belt lengthwise in a direction to tension the belt;

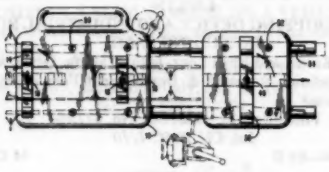
the attachment means including means for rotating the bar member to the channel as the belt is pulled lengthwise.

4,500,128

DEVICE FOR CARRYING FISHING RODS

John McClure, 2145 Brescia, Claremont, Calif. 91711

Filed May 24, 1983, Ser. No. 497,685
Int. Cl.³ B65D *71/00*
U.S. Cl. 294—146 **7 Claims**



1. A device for carrying fishing rods comprising:

(a) a first panel-like member having two opposite generally planar sides and a handle along one edge thereof, clamp means adjustably affixed to said first panel-like member, said clamp means having an inner surface disposed to engage said rods, said clamp means being adjustable such that movement of said clamp means toward said first panel-like member forces said rods against the surface of said first panel-like member;

(b) a second panel-like member having clamp means adjustably affixed thereto, said clamp means having an inner surface disposed to engage said rods, said clamp means being adjustable such that movement of said clamp means toward said second panel-like member forces said rods against the surface of said second panel-like member; and

(c) connecting means affixed to said panel-like members for maintaining said first and second panel-like members in a generally co-planar relationship, said connecting means being elongated members affixed to said first and second panel-like members, said second panel-like member being adjustable along the length of said connecting members.

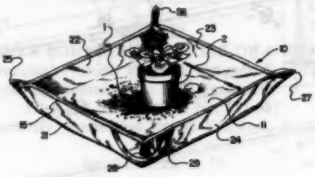
4,500,129

PROTECTIVE PAD

Terrence P. Hahn, 32032 Via Slona, San Juan Capistrano, Calif. 92693

Filed Mar. 9, 1983, Ser. No. 473,797
Int. Cl.³ A47G *7/02*
U.S. Cl. 294—172 **6 Claims**

1. A pad comprising a sheet of flexible material having a top and bottom face, a plurality of fastening means spaced around the edge of the flexible material on the top face, adjacent fastening means being attached to each other for folding the edge of the flexible material upward to form a lip around the top face of the pad, the flexible material lying flat when the



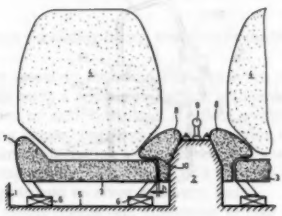
fastening means are released from each other, and handle means having at least two opposed handles near the edge of the pad for holding the pad and positioned to fold the edges of the pad toward each other when the pad is lifted by the handles.

4,500,130

VEHICLE SEAT

Michel Harmand, Meudon-La-Foret, France, assignor to Automobiles Citroen, Neuilly and Automobiles Peugeot, Paris, both of, France

Filed Jan. 4, 1983, Ser. No. 455,566
Claims priority, application France, Jan. 11, 1982, 82 00548
Int. Cl.³ B60N *1/02*
U.S. Cl. 296—65 R **9 Claims**



1. In a seat for a vehicle comprising a central console, of which the horizontal seat element comprises lateral pads rising above a horizontal portion of a horizontal seat element of the seat which is movable in translation along said central console, the improvement wherein,

an inner pad member forming one of said lateral pads is independent of the horizontal seat element of the seat and is fixed on an adjacent side wall of the console.

4,500,131

VISOR CONTROL

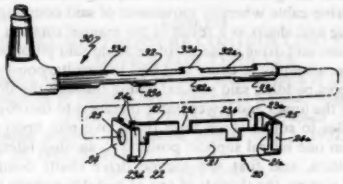
Dennis J. Fleming, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Jun. 28, 1982, Ser. No. 392,534
Int. Cl.³ B60J *3/02*; F16C *11/04*
U.S. Cl. 296—97 K **12 Claims**

10. A visor control including a spring clamp for mounting to a visor and for receiving a visor pivot rod for providing a visor holding force, said control comprising:

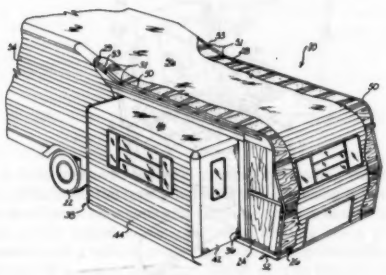
an elongated U-shaped clamp formed by a base and first and second integral resilient legs extending from opposite edges of said base and spaced a distance from one another to apply a compressive force to a visor pivot rod posi-

tioned therebetween, said clamp including spaced recesses cooperating with alternately staggered lobes and flats on a



pivot rod to urge and releasably hold the visor in a raised stored position.

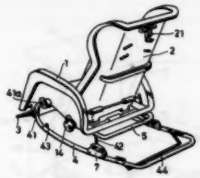
4,500,132
TRAVEL TRAILER FRAME SUPPORT
Clarence T. Yoder, 11642 County Road 36, Goshen, Ind. 46526
Filed Sep. 26, 1983, Ser. No. 535,946
Int. Cl.³ B62D *39/00*
U.S. Cl. 296—171 **4 Claims**



1. In combination, a mobile structure and a frame support for said mobile structure, said mobile structure including a longitudinal frame, an axle attached in said frame and carrying wheels, a floor secured to said frame, side walls and end walls extending upwardly from said floor, one of said side walls having an opening formed therein rearwardly of said axle, a roof overlying said end walls and side walls, a slideout room fitting in said side wall opening, and being shiftable between extended and retracted positions, said frame support including a strap secured at one end portion to one of said floor and frame and continuing in tension rearwardly of said side wall opening upwardly along one of said end walls and forwardly along said roof, said strap secured at its other end to said roof.

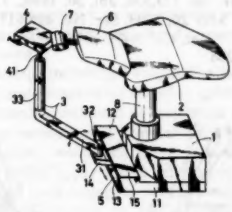
4,500,133
BABY CHAIR
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Sep. 2, 1982, Ser. No. 414,091
Int. Cl.³ B60R *21/10*
U.S. Cl. 297—131 **13 Claims**

1. A baby chair comprising: a chair body including a seat portion and a back rest portion; main support leg means for supporting said chair body, said main support leg means including an integrally formed U-shaped main support leg member pivotally coupled directly to said seat portion of said chair body; means for supporting said main support member in a lateral position at which said main support leg member is located substantially below an underside surface of said seat portion; and means for holding said support member in a rising



position at which said main support leg member is located substantially behind said back rest portion.

4,500,134
DENTAL TREATMENT CHAIR ASSEMBLY
Kazuyoshi Kaneko, Tokyo, and Jun Tamura, Kyoto, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan
Filed Aug. 3, 1982, Ser. No. 404,693
Claims priority, application Japan, Aug. 14, 1981, 56-121235[U]
Int. Cl.³ A47B *83/02*
U.S. Cl. 297—170 **6 Claims**



1. A dental treatment chair assembly including a dental treatment chair (2) elevatably mounted on a base (1) and a unit table (4) elevatably and rotatably supported by an arm mechanism (3), said assembly being characterized in that said arm mechanism (3) is attached to said base (1) so as to permit the sliding of the arm mechanism (3) within a slot (5) in said base (1), said slot (5) maintaining a cross relation with the longitudinal body axis l of said dental chair and opening in the direction of the head portion of the dental chair.

4,500,135
BABY CAR SEAT
Dan Kincheloe, San Clemente, Calif., assignor to Kim-Kee Enterprises, San Clemente, Calif.
Filed Apr. 20, 1983, Ser. No. 486,704
Int. Cl.³ A47C *1/08*
U.S. Cl. 297—250 **11 Claims**

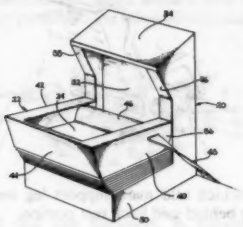
1. A baby car seat, comprising:

seat-like means for resting on a seat, said seat-like means being a means for maintaining a baby in a sitting position and for supporting the baby's back,

enclosure means attached to said seat-like means and rotatable with respect thereto between first and second positions, said enclosure means in said first position extending over and forward of the baby's abdomen so as to not substantially obstruct the baby's play and vision, said enclosure means in said second position extending upward in front of the baby's chest and head and together with said seat-like means, substantially enclosing the baby's body and head in a protective enclosure,

means for coupling said baby car seat to a car seat belt, and

means for rotating said enclosure means from said first position toward said second position in response to an inertial force,



whereby, in response to the force created by a collision, said rotating means will rotate said enclosure means toward said seat-like means to provide a protective enclosure for the baby in case of an accident.

4,500,136

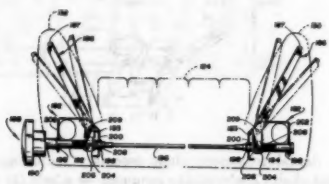
VEHICLE SEAT INCLUDING IMPROVED ADJUSTABLE SIDE BOLSTERS

Randall T. Murphy, Farmington Hills, and Dennis Heling, Canton, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Division of Ser. No. 173,536, Jul. 30, 1980,. This application May 20, 1983, Ser. No. 496,617

Int. Cl.[3] **A47C** *3/00, 7/14*

U.S. Cl. 297—284 **1 Claim**



1. In combination with a vehicle seat having a backrest portion and a seating portion, a pair of movable lateral bolster sections mounted on opposite sides of at least one of said portions and projecting therefrom, and adjustment means including a pair of drive members comprising pins for selectively and simultaneously moving the bolster sections in a controlled fashion between a first lateral support position and a second lateral support position, said adjustment means being adapted to maintain the bolster sections in the first and second lateral positions wherein each of said bolster sections has inner and outer parts, said sections being connected at opposite sides of said one of said portions at their inner parts and wherein said one of said portions includes a frame assembly having a pair of mounting flanges and wherein each of said bolster sections includes a rigid support paddle, having an outer free end portion, an inner, supported end portion and upper and lower spaced frame members having elongated slots formed therethrough and adjacent the supported end portion, the inner end portion of said support paddle being hingedly connected to said mounting flanges to permit the support paddle to rotate about a first longitudinal axis and wherein each support paddle is hingedly connected to its respective drive member to permit the support paddle to rotate with respect to the drive member about a second longitudinal axis spaced away from the first longitudinal axis towards said frame end portion to move the free end portion of the support paddle about the first longitudinal axis, coupling means comprising a flexible drive cable pivoted to said frame assembly to rotate thereon about a pivot point, operating means including first and second rotary drive shafts rotatably supported by said frame assembly with handle means for manually rotating one of said drive shafts, a pair of coupling members threaded on their respective drive shafts to be movable along said shafts, said coupling members coupled to said drive cable whereby movement of said coupling members along said shafts as a result of the manual rotation of said shaft causes said drive cable to rotate about said pivot point on said frame assembly to cause said pins to simultaneously move said support paddles, said pins extending through the slots and engaging the upper and lower frame members to thereby cause the paddles to rotate about their respective pins upon movement from one lateral support position to another lateral support position, said first and second drive shafts comprising threaded screws, the threads of one of said drive shafts having a right-handed configuration and the threads of the other of said drive shafts having a left-handed configuration.

4,500,137

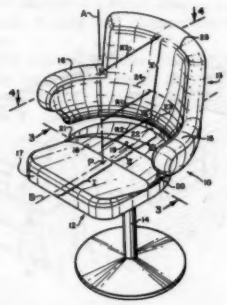
PHYSIOLOGICAL CHAIR

Laurence E. Morehouse, 209 16th St., Manhattan Beach, Calif. 90266

Filed Jan. 21, 1982, Ser. No. 341,542

Int. Cl.[3] **A47C** *7/02, 7/46*

U.S. Cl. 297—458 **9 Claims**



1. A physiological chair including a seat having forward, central and rear sections,

(a) said forward section sloping downwardly at a first acute angle adjacent to its front edge to its interception with said central section to provide thigh support for an occupant;

(b) said central section sloping upwardly at an angle less than said acute angle from its interception with said forward section to its interception with said rear section to provide a tuber support for said occupant;

(c) said rear section having a generally crescent shape when viewed in plan so that it wraps partially around the sides of said central section, said rear section initially sloping upwardly at an acute angle corresponding to said first acute angle, thence gradually sloping upwardly more steeply to terminate in an arcuate edge of the seat extending over at least 150° and being in the shape of a cup rim to provide sacral support for an occupant, even should said occupant sit obliquely on said seat; and

(d) back and arm rests, said back rest including a lower section concavely contoured when viewed in plan and including a convexly curved portion when viewed in side cross section providing a bulge functioning as a hip rest, each of said arm rests constituting integral continuations of said concavely contoured back portion over arcuate extents so that the tops of the arm rests and concavely contoured back at the same horizontal level define a continuous arc when viewed in plan, said arm rests having downwardly sloping inner surfaces including convex curved portions providing bulges at the same level as and integrally connecting with the bulge on said lower back

portion so that the hip rest is extended over a continuous arc and hip and back support is provided by the arm rests when said occupant sits obliquely in said seat.

4,500,138

BRAKE OIL PRESSURE CONTROLLING VALVE DEVICE FOR VEHICLES

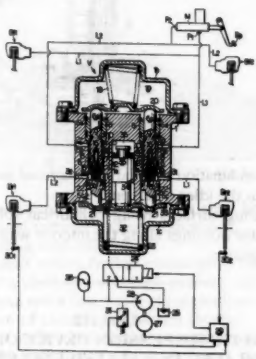
Mitutoyo Mizusawa, and Masao Fujisawa, both of Ueda, Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed May 6, 1983, Ser. No. 492,423

Claims priority, application Japan, May 7, 1982, 57-76209; May 26, 1982, 57-89392

Int. Cl.³ B60T *8/02, 8/26*

U.S. Cl. 303—6 C **6 Claims**



1. In an improved brake oil pressure controlling valve device for vehicles of the type wherein a valve housing is interposed in an oil path connecting an output port of a master cylinder and a rear wheel brake, said valve housing being provided therein with a reducing valve adapted to proportionally reduce output oil pressure from said output port to transmit the thus reduced oil pressure to said rear wheel brake, and with a pressure adjusting spring for urging said reducing valve in the valve opening direction and determining a reduction starting pressure thereof, the improvement wherein said valve housing is further provided therein with:

a pressure reducing piston which is normally held by virtue of resilient force of a set spring at its advanced limit position where said reducing valve is made open and which is retreated, when the resilient force of said set spring is released, to close said reducing valve and reduce pressure on the output side of said reducing valve;

a controlling oil pressure chamber supplied with oil pressure from on oil pressure source when a rear wheel is about to come into a locked state;

a controlling piston operable with oil pressure within said controlling oil pressure chamber to allow said reducing valve to be released from the resilient force of said set spring; and

wherein said output port of the master cylinder is composed of a first output port and a second output port, said rear wheel brake is composed of a right rear wheel brake and a left rear wheel brake, said oil path is composed of a first oil path connecting said first output port with said right rear wheel brake and a second oil path connecting said second output port with said left rear wheel brake, said reducing valve is composed of a pair of first and second reducing valves which are provided on the right and left side portions of said valve housing, respectively, said first reducing valve is interposed in said first oil path, said second reducing valve is interposed in said second oil path, a left front wheel brake is connected to said first oil path on the upstream side of said first reducing valve, and a right front wheel brake is connected to said second oil path on the upstream side of said second reducing valve.

4,500,139

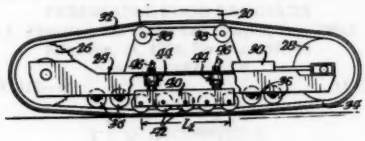
CRAWLER TRACK SUPPORT SYSTEM WITH VERTICALLY EXTENSIBLE CENTRA ROLLERS

Frank J. Tucek, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 28, 1983, Ser. No. 461,862

Int. Cl.³ B62D *55/14*

U.S. Cl. 305—10 **6 Claims**



1. A support system for an endless crawler track for selectively altering the length of the ground-engaging portion of the track, comprising:

an undercarriage including a longitudinally extending frame member, and a track drive sprocket roller and a track idler roller rotatably mounted at respective opposite ends of said frame member, said crawler track being mounted on and extending about said drive sprocket and said idler roller to define upper and lower runs of said track;

a plurality of track-engaging rollers mounted in longitudinally spaced relation on said longitudinally extending frame member, said track-engaging rollers being adapted to engage the upwardly-facing surface of the lower run of said crawler track;

relatively vertically positionable roller support means mounted on and positioned generally beneath said longitudinally extending frame members, at least one-half of said plurality of track-engaging rollers being mounted on said frame member by common mounting on said roller support means for relative vertical movement therewith;

fluid actuated motor means operatively disposed between said longitudinally extending frame member and said roller support means for providing relative vertical movement of said roller support means and said ones of said track-engaging rollers mounted thereon with respect to said frame member between a first, retracted position and a second extended position, wherein in said retracted position the length of the ground-engaging portion of the lower run of said crawler track generally corresponds to the distance between the respective rotational axes of said drive sprocket and said idler roller, and wherein in said extended position the length of the ground-engaging portion of the lower run of said track generally corresponds to the distance between the respective rotational axes of the two longitudinally endmost ones of the ones of said track-engaging rollers mounted on said roller support means; and

means on said longitudinally extending frame member for positively engaging said roller support means when said roller support means are in said retracted position to substantially eliminate the vertical load carried by said motor means.

4,500,140

SLIDE FOR DRAWERS AND THE LIKE

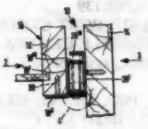
Karl Lautenschläger, Jr., and Horst Lautenschläger, both of Reinheim, Fed. Rep. of Germany, assignors to Karl Lautenschläger KG, Möbelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

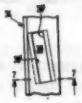
Filed Oct. 26, 1983, Ser. No. 545,682

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3239956

Int. Cl.³ F16C *29/04*

U.S. Cl. 308—3.8 **13 Claims**





1. A guide for a drawable cabinet part, comprising: an elongated profiled guiding rail having a front and rear end and to be fastened to a cabinet carcass, an elongated profiled running rail having a front and a rear end and to be fastened to the drawable cabinet parts, at least one wheel journalled on said guiding rail at said front end thereof, and at least one wheel journalled on said running rail at said rear end thereof, each wheel running on a profile limb of the other rail, said rails being displaceable relative to one another by means of said wheels, and adjusting means disposed on said guiding rail and resting on said running rail for adjusting lateral play of said drawable cabinet part with respect to said carcass, said adjusting means being an elongated guiding strip held on the guiding rail and longitudinally displaceable in the drawing direction of the drawable part, said adjusting means having a surface facing away from said carcass and lying against said running rail, said guiding rail having at least one adjusting surface or edge for supporting said guiding strip and which runs at an angle to the drawing direction, such that a component of displacement transverse to the drawing direction is superimposed on said guiding strip upon displacement in said drawing direction.

4,500,141

DRILL STEEL IDLER GUIDE

Estes M. Daugherty, 2804 Mimosa Dr., Sherman, Grayson County, Tex. 75090

Filed Sep. 13, 1982, Ser. No. 417,603

Int. Cl.³ F16C *31/04*

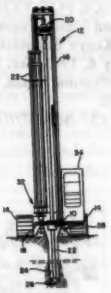
U.S. Cl. 308—4 R **2 Claims**

1. An idler guide for supporting drill pipe in a rotary drilling rig, comprising:

an elongated cylindrical member having a central cylindrical opening formed therethrough for receiving the drill pipe, said cylindrical opening having an inside diameter greater than the outside diameter of the drill pipe;

means for affixing said cylindrical member to the rotary drilling rig;

a plurality of rotatable bearing surfaces aligned along the inside wall of said cylindrical member, said bearing members projecting inwardly beyond the interior wall of said cylindrical member, said bearing members projecting inwardly beyond the interior wall of said cylindrical member for engaging the drill pipe for reducing the frictional forces on the drill pipe moving in said cylindrical member, said bearing surfaces being adapted to rotate freely with



any combination of axial or rotational movement of drill steel in the idler guide; and

said bearing surfaces being cylindrical rollers mounted in rotatable housings along the interior wall of said cylindrical member.

4,500,142

MAGNETIC SUSPENSION DEVICE OF A ROTOR PLACED IN A SEALED ENCLOSURE

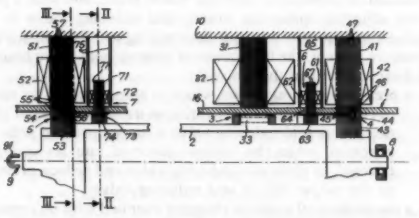
Maurice Brunet, St. Marcel, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed Jun. 13, 1983, Ser. No. 503,626

Claims priority, application France, Jun. 17, 1982, 82 10600

Int. Cl.³ F16C *39/06*

U.S. Cl. 308—10 **9 Claims**



1. Magnetic suspension device for a rotor placed in a sealed enclosure, comprising at least two active radial electromagnetic bearings servocoupled by means of position detectors to support the rotor without contact, each bearing comprising an annular armature of laminated magnetic material mounted on the rotor and a stator composed of electromagnetic windings associated with a yoke of laminated magnetic material which has end pole pieces positioned at a short distance from the annular armature, but without contact with the latter, and the electromagnetic windings being all positioned outside the sealed enclosure, wherein the sealed enclosure includes fluid-tight walls at least some portion of which is formed of glass, each stator yoke of laminated material being extended to the level of the end pole pieces by a terminal portion of non-laminated magnetic material, of little thickness, constituted by a set of small solid pieces formed of a magnetic material of high resistivity and relative permeability greater than about 200, arranged parallel to the magnetic lines of force, and molded in

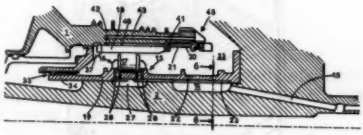
glass so as to be attached in sealed manner to the glass portions of the wall of the sealed enclosure.

4,500,143

MEANS FOR CONTROLLING CLEARANCE IN AN INTERSHAFT BEARING JOURNAL OF A MULTI-SPOOL GAS TURBINE

Robert Kervistin, Le Mee Sur Seine; Alain M. J. Lardellier, Melun; Georges Mazeaud, and Francois E. G. Crozet, both of Yerres, all of France, assignors to S.N.E.C.M.A., Paris, France

Filed Dec. 22, 1982, Ser. No. 452,131
Claims priority, application France, Dec. 22, 1981, 81 23900
Int. Cl.³ F16C *37/00*; F01D *25/12*; F02C *7/06*
U.S. Cl. 384—467 **9 Claims**



1. A clearance control device in an inter-shaft bearing journal of a multi-spool turbojet engine, comprising:

means for feeding cold oil;

a first outer shaft which further comprises a high pressure trunnion of a shaft line of a high pressure spool, and including a bore and a first series of longitudinal holes and a second series of radial holes formed therein;

a second, inner shaft which further comprises a low pressure trunnion of a shaft line of a lower pressure stage wherein said high pressure trunnion revolves in relation to said low pressure trunnion;

an outer ring mounted directly on the first shaft;

an inner ring mounted upon the second shaft; and

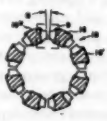
a roller bearing mounted so as to be disposed between said first and second shaft and wherein said longitudinal holes of said high pressure trunnion have a length at least equal to the width of said outer ring and wherein said bore of said high pressure trunnion includes a series of grooves formed therein which communicate with said cold oil feeding means and via said radial holes with said series of longitudinal holes and within which the cooling oil circulates.

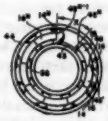
4,500,144

BEARING MEMBER

Hugo N. de Campos, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 2, 1984, Ser. No. 596,221
Int. Cl.³ F16C *33/38, 33/66*
U.S. Cl. 384—463 **10 Claims**





5. A bearing member comprising:

an outer race member having a cylindrical member with a bore therethrough, said cylindrical member having a concentric groove connected to said bore;

a series of arcuate sections having a semi-spherical peripheral surface and a semi-spherical inner surface, said peripheral surface located in said concentric groove, each of said sections having semi-spherical pockets located on the end thereof and arcuate wing sections axially extending from said semi-spherical surface;

a series of balls located in said concentric groove and between said semi-spherical pockets; and

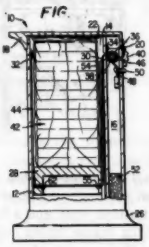
an inner race member having a cylindrical member with a peripheral groove thereon, said inner semi-spherical surface of said arcuate segments and balls being located in said peripheral groove, said peripheral groove retaining said balls in radial alignment with said concentric groove, said semi-spherical peripheral surfaces of the arcuate sections engaging said outer race prior to said spherical pockets engaging said balls to prevent the development of a radial force that could adversely effect the arcuate sections.

4,500,145

APPARATUS FOR STORING AND SERVING PERISHABLE FOOD PRODUCTS

Arthur L. Fassauer, 420 Forest La., Canyon, Tex. 79015

Filed Jan. 21, 1983, Ser. No. 459,768
Int. Cl.³ A47F *1/06*
U.S. Cl. 312—61 **11 Claims**



1. An apparatus for storing and dispensing perishable food products, comprising;

a semi-airtight container with a hollow interior having:

a lower cuboidal shaped housing with an opening on one end thereof,

a rectangular lid for disposal over said opening,

a gasket disposed on said lid between said lid and said housing, and

a breakover hinge attached to one edge of said lid and one edge of the opening on said lower housing for rotation of said lid thereon, said breakover hinge providing a closing force when said lid is mated to said opening on said lower housing;

platform means slideably disposed with said airtight container for defining a variable volume therein for receiving and containing the food products, said platform means having a planar side disposed parallel to the opening in said container; and

motive force means for applying a distributed force to the side of said platform means opposite the opening on said container to selectively urge said platform means toward said opening to dispense the food products contained in said variable volume and away from said opening for storing said food products, the platform being maintained at a position during storage and when the lid is closed so that said variable volume is maintained essentially equal to the volume of the remaining food products:

said motive force comprising:

an auxiliary chamber adjacent the hollow interior of said container;

a shaft disposed in said chamber and rotatably mounted on the exterior walls of said container;

a cord having one end thereof connected to one edge of the opening in said container and extending down the vertical side of the interior of said container diametrically opposite said auxiliary chamber, around the end of said platform means opposite said opening and extending up the vertical side of said container adjacent said auxiliary chamber to attach to said shaft for winding thereabout such that rotation of said shaft winds said cord about said shaft to thereby urge said platform means toward said opening; and

means for rotating said shaft.

4,500,146

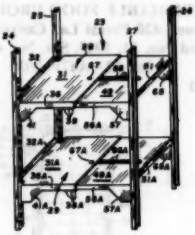
LOCKER SHELF ASSEMBLY

Richard R. Peterson, Minnetonka, Minn., assignor to Sioux Technology, Inc., Minnetonka, Minn.

Filed Aug. 1, 1983, Ser. No. 519,038

Int. Cl.³ A47F *5/00*

U.S. Cl. 312—257 SM **16 Claims**



7. A portable and removable shelf assembly for a locker having opposite first and second side walls, a back wall joined to the side walls, a bottom wall, and a front door frame having a doorway, said door frame being joined to the side walls providing access to the interior of the chamber of the locker defined by said walls, said chamber having corners comprising: a plurality of upright first rails located adjacent the first side wall, a plurality of upright second rails adapted to be located adjacent the second side wall, said first and second rails being unattached to said side walls to allow removal of the rails from the locker chamber, shelf means for supporting articles, said rails and shelf means having cooperating means for releasably mounting the shelf means on the rails in a selected position, said shelf means having a first shelf member and a second shelf member, means on said first and second shelf members for guiding the shelf members for lateral movement relative to each other, said shelf members being laterally movable relative to each other to expand the shelf means and locate the first rails adjacent said first side wall and locate the second rails adjacent said second side wall, and means for holding the shelf members in an expanded position to thereby locate the shelf assembly in the locker chamber with the first and second rails positioned adjacent the first and second side walls of the locker.

4,500,147

REFRIGERATOR SHELF DOORS

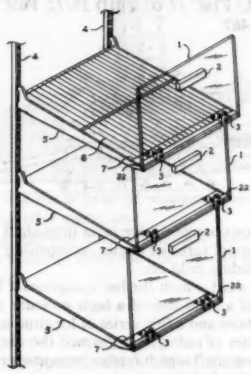
Richard A. Reister, Rte. 1, Box 124H, Tryon, Okla. 74875

Filed Mar. 17, 1983, Ser. No. 476,139

Int. Cl.³ A47B *77/04*

U.S. Cl. 312—291 **16 Claims**

1. In a refrigerator, freezer, or side by side refrigerator-freezer, individual shelf means within said refrigeration units, normal outside door means for said refrigeration units; individual door means for said individual shelf means, said individual shelf door means being in addition to said normal outside door means, hinge means for said individual shelf door means, means to attach said hinge means near the bottom of said individual shelf door means, means to affix the axis of said hinge means for said individual shelf door means near the front edge of said individual shelf means, doorstop means for said individual shelf door means, said doorstop means permitting the top of each individual shelf door means to be recessed inwardly behind the front edge of the individual shelf means immediately above, handle means for said individual shelf door means, means to affix said handle means near the top of said individual shelf door means, said recessment of the top of said individual shelf door means inwardly behind the front edge of the individual shelf means immediately above providing an enhancement in the appearance of said individual shelf door means and said refrigeration units, said recessment of the top of said individual shelf door means further providing gravity action to keep the



individual shelf door means in a closed position, said recessment of the top of said individual shelf door means further providing convenient space for said handle means for said individual shelf door means within said refrigeration units when said normal outside doors of said refrigeration units are in a closed position, said individual shelf door means being transparent, opening of said individual shelf door means for removal of food providing a minimal loss of cold air from said refrigeration units, said transparent individual shelf door means permitting convenient selection of foods to be removed without hurriedly closing said normal outside door means of said refrigeration units.

4,500,148

DISPLAY AND STORAGE UNIT

Homer F. King, Elmhurst, Ill., assignor to H. King & Associates, Ltd., Elmhurst, Ill.

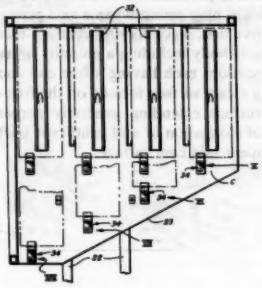
Filed Jan. 31, 1983, Ser. No. 462,580

Int. Cl.³ A47B *51/00*

U.S. Cl. 312—312 **8 Claims**

1. A display and storage unit for articles arranged in a plurality of segregated groups, said unit comprising a housing having an interior chamber with an open bottom, said open bottom being exposed and positioned a substantial distance above a supporting surface; a plurality of carriers each accommodating a predetermined number of segregated article groups, said carriers being disposed in substantially face-to-face relation within said chamber, each carrier being mounted for independent movement between predetermined modes, when in a first mode, each carrier being substantially concealed within said chamber, when in a second mode, a substantial portion of the carrier projects downwardly through the housing open bottom whereby depleted groups of accommodated articles can be manually replenished, and when a predetermined number of said carriers are simultaneously in a third mode intermediate said first and second modes, the corresponding lower portions of said predetermined number of carriers are exposed and extend downwardly through said housing open bottom a pre-

determined amount so that said exposed lower portions are arranged in a downwardly stepped relation when viewed from



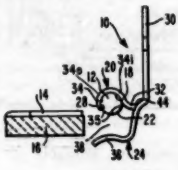
the front side of the unit; and independently adjustable means co-acting with the housing and each carrier for retaining each of said carriers in a selected mode.

4,500,149

SOLDER-BEARING LEAD

Robert D. Mackay, North Andover, Mass., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,631
Int. Cl.³ H05K *1/00*; H01R *11/22, 4/02*
U.S. Cl. 339—17 C **10 Claims**



1. A solder-bearing lead, which comprises:

an elongated stem;

first and second resilient clamping fingers having respective opposed clamping portions extending in opposed spaced relationship from the elongated stem, the clamping portion of the first resilient clamping finger having an inner surface in opposed spaced relationship to an inner surface of the clamping portion of the second resilient clamping finger; and

a solder preform attached to the inner surface of the clamping portion of the first resilient clamping finger and having a surface portion disposed in opposed relationship to the inner surface of the clamping portion of the second resilient clamping finger such that the surface portion of the solder preform and the inner surface of the clamping portion of the second resilient clamping finger define respective opposite sides of a gap for receiving a substrate therebetween, and such that the surface portion of the solder preform directly enngages a contact pad on the substrate when the substrate is received between the surface portion of the solder preform and the second clamping portion;

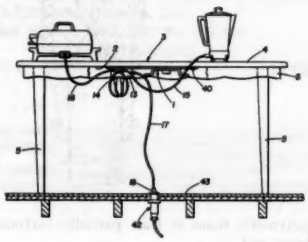
the clamping portion of the first resilient clamping finger being partially wrapped about the solder preform to attach the solder preform to the inner surface of the clamping portion, and the clamping portion including an inner wrapped section which merges into an outer wrapped section having an outer end portion which terminates adjacent the contact pad-engageable surface portion of the solder preform in spaced relationship to the inner wrapped section of the clamping portion to define an opening through which the surface portion of the solder preform extends to define the respective side of the substrate-receiving gap.

4,500,150

DEVICE FOR ELECTRIFYING DINING TABLE

Robert L. Leibensperger, and Donna C. Leibensperger, both of 4731 Woodside Ave. NW., Canton, Ohio 44709

Filed Jun. 23, 1982, Ser. No. 391,114
Int. Cl.³ H01R *25/06*
U.S. Cl. 339—28 **15 Claims**



1. A device for electrifying a dining or food serving table including:

(a) a mounting plate;

(b) means for attaching the mounting plate to the table, which means is completely concealed beneath the table on the underside surface of the table to be electrified;

(c) first receptacle means mounted on the plate for receiving a plug of a cord of an electric appliance placed on the upper surface of the table with said cord extending over the table edge;

(d) an electric supplying cord connected with the first receptacle means having a plug end;

(e) holding means provided on the plate for holding substantially the entire supply cord wound in a stored position;

(f) clip means formed on the mounting plate adjacent the first receptacle means for releasably gripping a cord of said electric appliance and for maintaining a subsantial portion of the cord adjacent the underside surface of the table, which cord is connected with the first receptacle means to prevent the plug end of the cord from being pulled from the receptacle; and

(g) second receptacle means adapted to be mounted in a floor directly beneath the table and connected to a source of electric power for receiving the plug end of the electric supply cord to supply power to the first receptacle means.

4,500,151

MARINE ELECTRICAL PLUG

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 19, 1982, Ser. No. 443,000
Int. Cl.³ H01R *11/00*
U.S. Cl. 339—59 R **9 Claims**

1. A plug, male or female, for an underwater electrical cable comprising:

an electrical contact insert;

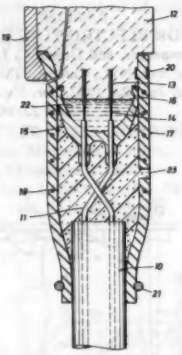
at least one conductive pin extending from said electrical contact insert;

at least one insulated conductor extending from said electrical cable and into conductive contact with said conductive pin;

a non-conductive material disposed surrounding the locale

of said conductive contact of said conductive pin and said insulated conductor;

a seal boot forming a cup partially surrounding the non-conductive material, with the electrical contact insert being on the opposite side of the non-conductive material from the seal boot;



a polymeric foam at least partially surrounding said seal boot; and

an outer boot at least partially surrounding said polymeric foam, a rim of the seal boot being secured between a recess in the electrical contact insert and the outer boot.

4,500,152

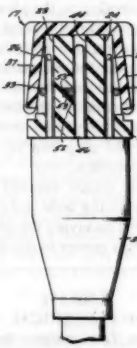
UNIVERSAL OUTLET

S. Scott Hammill, Mount Laurel, N.J., assignor to SL Industries, Inc., Marlton, N.J.

Continuation-in-part of Ser. No. 190,050, Sep. 23, 1980, Pat. No. 4,364,623. This application Sep. 30, 1982, Ser. No. 430,608

Int. Cl.³ H01R *11/00*

U.S. Cl. 339—61 M **17 Claims**



5. An electrical receptacle comprising: a receptacle body of electrical insulating material; means defining first, second, and third spaced, parallel, elongated prong-receiving slots in said receptacle body; first, second, and third conductor wires, each having a bare, uninsulated portion thereof, and each being substantially longer than any dimensions of said body; means formed on said receptacle body for receiving said first, second, and third conductor wire bare portions and mounting said first conductor bare portion so that it extends substantially perpendicular to and intersects said first prong-receiving slot, mounting said second conductor wire bare portion so that it extends substantially perpendicular to and intersecs said second prong-receiving slot, and mounting said third conductor wire bare portion so that it extends substantially perpendicular to and intersects said third prong-receiving slot, and for mounting said conductor wires so that said first, second, and third conductor wire bare portions will be directly tangentially engaged by an electrical plug prong when a said prong is inserted into said respective first, second, or third prong-receiving slots; and said receptacle body including a plurality of elongated flexible cantilever portions each having a free end and fixed end, and each having a cam surface formed on the free end thereof and a locking surface extending generally perpendicular to the dimension of elongation of said cantilever portion, and immediately adjacent said cam surface.

4,500,153

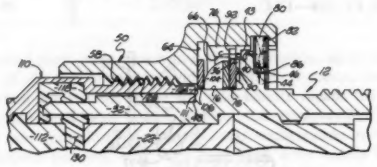
SELF-LOCKING ELECTRICAL CONNECTOR

William R. Mattingly, Jr., Santa Ana, Calif.; Lyle Johnson, Ft. Lauderdale, Fla., and Tommy B. Maher, La Verne, Calif., assignors to Matrix Science Corporation, Torrance, Calif.

Filed Nov. 9, 1981, Ser. No. 319,543

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—89 M **11 Claims**



6. An electrical connector assembly for being interconnected to a first shell comprising:

a cylindrical second shell having a cylindrical outer surface and an annular nut retention flange extending outwardly therefrom, the nut retention flange having an annular first stop shoulder disposed about its periphery on one side for facing in a first axial direction and a flange retention shoulder positioned on another side, opposite the one side, for facing in a second axial direction opposite the first axial direction;

a coupling nut rotatably mounted to the second shell about its outer surface, the coupling nut having an interior surface with an annular groove therein defining an annular groove retention shoulder which faces in the first direction, the interior surface of the coupling nut further having an annular radially extending spring retention shoulder facing in the second axial direction, the annular groove being bounded on one of its sides by a radially extending annular second stop shoulder integral with the coupling nut and facing in the second axial direction;

a retention ring positioned for abutting against the groove retention shoulder on one of its sides and against the flange retention shoulder on the other of its sides; and

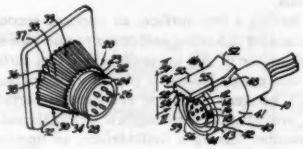
a wave spring positioned between the spring retention shoulder and the nut retention flange, the first and second stop shoulders aligned in axially facing relationship for abutting each other to prevent relative axial movement between the second shell and the coupling nut when the coupling nut is moved to decouple the first and second shells from each other for limiting the amount of compression of the wave spring during said decoupling.

4,500,154

ELECTRICAL CONNECTOR ASSEMBLY HAVING AN ANTI-DECOUPLING DEVICE

Gordon T. Collins, Franklin, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 30, 1983, Ser. No. 480,191
Int. Cl.³ H01R *13/623*
U.S. Cl. 339—89 M **9 Claims**



1. An electrical connector assembly having an anti-decoupling device, the assembly comprising: a pair of mateable connector shells adapted for mating along a primary axis and a coupling nut mounted for rotation on one of the shells for coupling the one shell to the other shell, said other shell including an annular shoulder the outer surface of which includes ratchet teeth spaced circumferentially therearound, and said anti-decoupling device comprising normally inoperative ratchet means engageable between said coupling nut and said other shell which become operative only when the connector shells approach their fully mated relation by rotation of the coupling nut in the mating direction, said ratchet means providing a lock against rotation of the coupling nut in the unmating direction and being manually releasable at any position where engaged without disturbing shell mating; and release means operative independently of said coupling nut rotation for releasing said ratchet means from engagement, said anti-decoupling device characterized by:

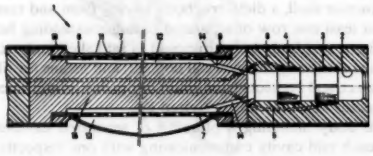
said release means comprising a latch member pivotally mounted to the coupling nut for flexure laterally of the axis and including at least one ratchet tooth for pivoting into and out of engagement with the ratchet teeth, and the outer circumference of said annular shoulder and the inner face of said latch member including said tooth define tapered and frusto-conical surfaces relative to the axis.

4,500,155

PLUG-IN ELECTRIC CONNECTOR FOR USE IN A LIQUID MEDIUM

André Chevalier, Pantin, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 17, 1982, Ser. No. 358,990
Claims priority, application France, Mar. 17, 1981, 81 05306
Int. Cl.³ H01R *13/523*
U.S. Cl. 339—94 M **15 Claims**



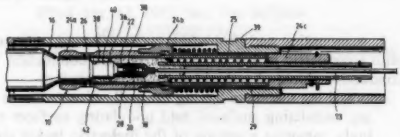
1. A plug-in connector for use underwater, comprising a socket provided with a bore adapted to receive a complementary plug, and a chamber containing an insulating product of substantial viscosity in communication with the bore of the socket for filling said bore with insulating product when said plug is withdrawn from the socket, said chamber comprising a rigid tube having a wall traversed by a plurality of channels and an elastic sleeve surrounding the tube and defining therewith said chamber of insulating product, the interior of said rigid tube being in permanent communication with said bore of said socket, and said sleeve constructed of sufficient elasticity for expelling insulating product from the chamber as a result of its elasticity for contacting substantially the entire surface of the outer wall of said rigid tube when said plug is withdrawn from said socket, and for causing said insulating product to fill said socket.

4,500,156

ELECTRICAL CONNECTOR

Khoi B. Nguyen, Sugar Land, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Mar. 2, 1983, Ser. No. 471,416
Int. Cl.³ H01R *13/523*
U.S. Cl. 339—94 C **12 Claims**



1. An electrical connector suitable for use in an underwater environment comprising:

a first and second member each having one or more electrically conductive elements thereon which members are adapted to mate with each other and thereby establish electrical contact between said conductive elements, said second member including a receptacle for closely receiving at least part of the other member and said part of said other member being adapted for insertion within said receptacle,

a housing for supporting said second member,

means, within wall portions of said housing, defining a passageway in communication with said receptacle for affording egress to an environment exterior to said receptacle for any fluids within said receptacle which are displaced during the mating of said members, and

means for interrupting said means for affording egress after said members have been mated and for sealing said receptacle from the exterior environment comprising:

resilient means affixed between said housing and said second member supported by said housing, for closely receiving at least part of said other member, and for sealing the outer periphery of said members from the exterior environment when said members are mated,

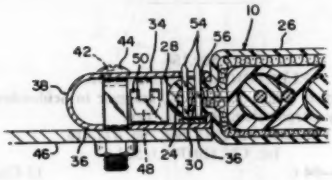
means for mounting said member being supported by said housing in said housing affording the movement of said member from a first position where said egress means provides communication with the exterior environment and said receptacle to a second position where said egress means is interrupted, and

biasing means axially aligned with said receptacle means and positioned between said housing and said member being supported by said housing, for biasing said supported member at said first position to afford an egress from said receptacle to the exterior environment through which, any fluids within said receptacle means can be displaced to the exterior environment, and whereby the continued application of a force on said members in the direction of mating in excess of the force being exerted by said biasing means affords the movement of said supported member to said second position thereby sealing said receptacle means from the exterior environment.

4,500,157
MOUNTING AND GROUNDING CLAMP FOR SHIELDED CABLE

Clifton W. Huffnagle, Camp Hill, and LeRoy J. Morningstar, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 21, 1982, Ser. No. 420,763
Int. Cl.³ H01R 4/24, 4/66
U.S. Cl. 339—97 R 7 Claims



1. A mounting and grounding clamp adapted to be secured onto a dielectric jacket and form a ground connection with a conductive shield of a shielded cable, comprising:

opposed leg members having inwardly-directed ends defining undulating surfaces, said undulating surfaces clampingly engaging a section of the dielectric jacket therebetween;

contact means extending outwardly from one of said leg members toward the other of said leg members in alignment with openings in the other of said leg members, said contact means adapted to penetrate through the dielectric jacket into electrical engagement with the conductive shield and extend into said openings;

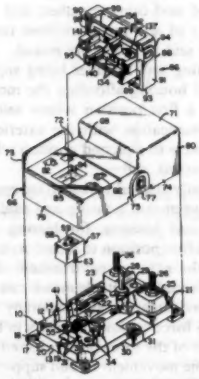
latch means on said leg members for latching said leg members together with said undulating surfaces in clamping engagement with the section of the dielectric jacket and said contact means in ground connection with the conductive shield and within said openings; and

means provided by said leg members for mounting said clamp onto an electrical grounding member.

4,500,158
NETWORK INTERFACE DEVICE

Frank P. Dola, Port Richey, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 31, 1983, Ser. No. 499,659
Int. Cl.³ H01R 13/514
U.S. Cl. 339—122 R 6 Claims



1. A network interface device for terminating network telephone wiring at a subscriber's premises and for connecting the subscriber's wiring to the network which comprises:

a base having a first surface, an opposed second surface, and means for mounting said base to a fixed surface so that said second surface faces said fixed surface, said base carrying on said first surface a telephone jack having a plurality of spring contacts therein and a like plurality of first terminals for connecting to said network telephone wiring, said spring contacts being electrically connected to said first terminals,

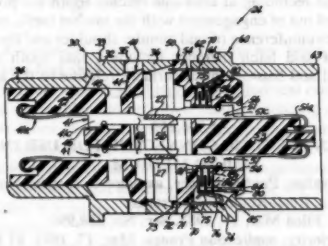
a cover having a first surface, an opposed second surface, and means for mounting said cover to said base so that said second surface of said cover faces said first surface of said base, said cover having a plurality of apertures therethrough between said first and second surface thereof which provide access to said first terminals and said jack,

a plug member having a first surface, an opposed second surface, and means for mounting said plug member to said cover so that said second surface of said plug member faces said first surface of said cover, said plug member carrying on said second surface a plurality of second terminals for connecting to said subscriber's wiring and arranged for mating to said first terminals through said apertures when said cover is mounted to said base and said plug member is mounted to said cover.

4,500,159
FILTER ELECTRICAL CONNECTOR

Francisco R. Briones, Markham, and Kamal S. Boutros, Downsview, all of Canada, assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 31, 1983, Ser. No. 528,290
Int. Cl.³ H01R 13/648, 13/66
U.S. Cl. 339—147 R 23 Claims



1. An electrical connector assembly including an electrically conductive shell, a dielectric body having front and rear faces and at least one row of separated passages extending between the faces, said body being disposed in said shell and each said passage receiving an electrical contact, and means for filtering said electrical contacts from radio frequency interference, said connector assembly characterized by:

said body including a plurality of separated cavities with each said cavity communicating with one respective passage;

said filter means comprising a discrete monolithic capacitor being received in each said cavity and disposed in contacting relation with the electrical contact disposed in the respective passage, said capacitor comprising a dielectric substrate having a live and a ground electrode with the live electrode contacting the electrical contact; and

means for electrically coupling each said electrical contact and capacitor to said shell.

4,500,160

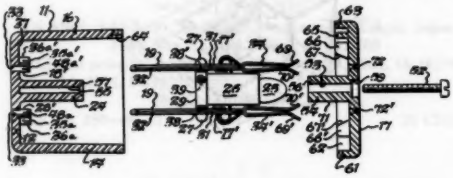
ELECTRICAL CONNECTOR DEVICE

Jack Bertsch, Orchard Park, N.Y., assignor to Polytronics, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 476,990, Mar. 21, 1983, abandoned. This application May 21, 1984, Ser. No. 612,745

Int. Cl.³ H01R *13/50*

U.S. Cl. 339—166 R 30 Claims



1. A connector device for placement between a female electrical outlet and a male plug comprising a housing, a first end wall on said housing, side wall means extending from said first end wall, a first post extending from said first end wall within said side wall means, a pair of first slots extending through said first end wall on opposite sides of said first post, a tubular member for mounting on said first post in mating relationship, a pair of diametrically opposed teates extending radially outwardly from said tubular member, a pair of combined prongs and prong receptacles having prong portions at first ends extending through said slots and having prong receptacles at their second ends for receiving prongs of an external male plug, central portions on said combined prong and prong receptacles, apertures in said central portions for fitting on said teats, a second end wall mountable on said side wall means in opposition to said first end wall, a pair of second slots in said second end wall in alignment with said prong receptacles, and means for securing said second end wall relative to said side wall means.

4,500,161

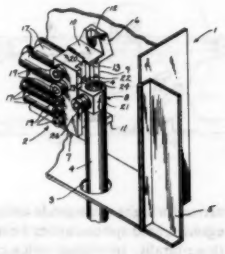
ELECTRICAL CONNECTOR WITH SLIDING COLLAR

Josef Keglewitsch, and Theodore J. Stechschulte, both of Bowling Green, Ohio, assignors to Marathon Electric Mfg. Corp., Wausau, Wis.

Filed Apr. 27, 1983, Ser. No. 489,202

Int. Cl.³ H01R *4/36*

U.S. Cl. 339—242 9 Claims



1. A connector assembly for providing connection between the conductors of an electric power cable and a plurality of leads, comprising:

a distribution block connectable to said leads, said block having a channel formed along one side thereof;

a terminal connector slidably mounted on said block for selective positioning thereof to provide contact between the cable and the block, said connector including a split collar body having an axial opening for receiving the ends of said conductors, a threaded bore communicating with said axial opening and extending normal thereto, and a pair of opposing legs projecting outwardly from the free ends thereof slidably received within said channel; and

a set screw disposed in said bore and engageable with the ends of said conductors to provide intimate contact between the conductors and the connector and to simultaneously spread said legs against the sides of said channel to provide intimate contact between said connector and said block.

4,500,162

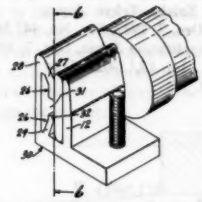
CONTACT CLIP APPARATUS FOR BLADE-TYPE CONTACTS

Josef Keglewitsch, and Theodore J. Stechschulte, both of Bowling Green, Ohio, assignors to Marathon Electric Manufacturing Corporation, Wausau, Wis.

Filed Apr. 12, 1982, Ser. No. 367,454

Int. Cl.³ H01R *11/22*

U.S. Cl. 339—252 F 14 Claims



1. A fuse clip apparatus for receiving a flat fuse blade comprising an extruded conductive member including a lead terminal connector, an open channel member integrally connected to said terminal connector and including a planar wall defining a blade-engaging contact surface having an extent and configuration substantially corresponding to that of the fuse blade and being engaged by the fuse blade in the operative state and a second support wall spaced from said contact surface, and a curved beam spring secured by means at the opposite ends to said support wall within said channel and curving inwardly from the opposite ends of said support wall and forming a curved spring means spanning the contact surface with the outermost curved portion located generally centrally of the blade-engaging contact surface, said outermost curved portion being spaced from the contact surface by a distance significantly less than the thickness of the fuse blade and establishing a horizontal deflection force in excess of the vertical insertion force whereby a fuse blade of a blade type fuse positioned between said contact surface deflects said beam spring and said beam spring functions to maintain said fuse blade in full surface contact with said contact surface.

4,500,163

HOLOGRAPHIC PROJECTION SCREEN

Richard H. Burns, N. Hollywood; William M. Hall, La Crescenta, and Bernard P. Hildebrand, El Toro, all of Calif., assignors to The Singer Company, Stamford, Conn.

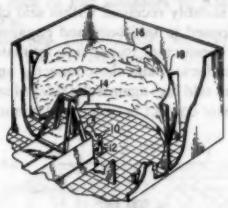
Filed Jul. 29, 1981, Ser. No. 288,085

Int. Cl.³ G03B *21/56*; G02B *5/32*

U.S. Cl. 350—3.7 10 Claims

1. A front projection viewing screen having a fixed size observation pupil at a predetermined position relative to the screen, said screen comprising an array of a plurality of ele-

mental screen areas wherein each of said elemental screen areas is formed of at least one elemental reflective hologram of



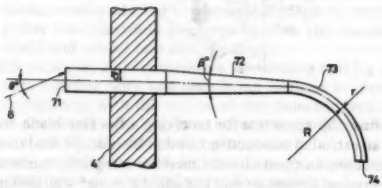
the observation pupil, and wherein each of said holograms is made with a specular object beam.

4,500,164

LIGHT TRIGGERED THYRISTOR, INCLUDING A LIGHT GUIDE, WHOSE PARAMETERS ARE RELATED BY AN EQUATION

Toyohiko Kiyohara, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1982, Ser. No. 447,598
Claims priority, application Japan, Dec. 7, 1981, 56-197339
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.10 **1 Claim**



1. In a light triggered thyristor, including; a light guide made of transparent material with a refractive index n_1, and having a light entrance end with a radius r_0, a light exit end with a radius r, a tapered portion tapering from the radius r_0 to the radius r with a taper angle β, and a bent portion having a bending radius R, the improvement wherein said light guide satisfying the following inequality when light is incident to said light entrance end with a maxium entrance angle θ with respect to a line normal to said entrance end:

$$n_1\left(\frac{1-\frac{r}{R}}{1+\frac{r}{R}}\right)\sin\left[\cos^{-1}\left(\frac{r_0}{r}\sin\left(\sin^{-1}\frac{\sin\theta}{n_1}+\frac{\beta}{2}\right)\right)-\frac{\beta}{2}\right]\geqq 1.$$

4,500,165

METHOD AND APPARATUS FOR ALIGNING OPTICAL FIBERS

Frederick W. Scholl, Riverdale, and Michael H. Coden, New York, both of N.Y., assignors to Codenoll Technology Corporation, Yonkers, N.Y.

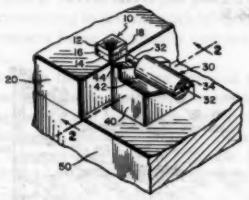
Filed Apr. 2, 1982, Ser. No. 364,649
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.20 **6 Claims**

1. Apparatus for aligning an optical fiber with a light source or photodetector comprising:

a substrate;

means for mounting said light source or photodetector on said substrate; and

means for mounting said optical fiber on said substrate such that said optical fiber is aligned with said light source or photodetector to permit coupling of light therewith, said



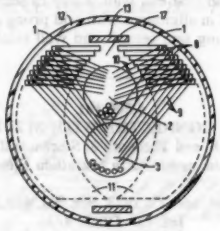
mounting means having a sloping surface set at an angle to the plane of said substrate, said optical fiber being cemented onto the sloping surface which aligns it with said light source or photodetector, and said sloping surface being tangent to an outer surface of said optical fiber.

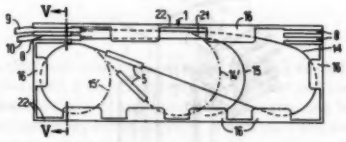
4,500,166

SPLICE CARRIER FOR LIGHT WAVEGUIDE CABLES

Dieter Kunze, Neuried, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,640
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 3133586
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **17 Claims**





1. In a splice carrier for light waveguide cables having bundles of light waveguides, said splice carrier being inserted into a cable sleeve with a plurality of similar splice carriers to form a splice connection between waveguides of two bundles from two cables entering opposite ends of the cable sleeve, each individual splice carrier being a rectangular member and containing both means for mounting the splices of the waveguides and means for storing excess length of the waveguides of each bundle of waveguides associated with the carrier, the improvement comprising each of the splice carriers having two opening means with an axis for introducing the incoming and outgoing bundles of light waveguides to the carrier, said opening

means being disposed on the same side of the splice carrier adjacent a corner of the rectangular member and adjacent each other in such a manner that an individual splice carrier can be pivoted around an imaginary point lying adjacent the corner and approximately on the axis of the two opening means.

4,500,167

OPTICAL ENERGY COLLECTING AND TRANSMITTING APPARATUS USING TUBULAR LIGHT TRANSMITTING ELEMENT

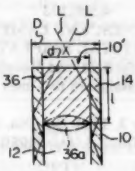
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,705

Claims priority, application Japan, Nov. 14, 1981, 56-182781; Nov. 14, 1981, 56-182782

Int. Cl.³ G02B 5/14, 5/16

U.S. Cl. 350—96.32 **26 Claims**



1. A tubular light transmitting unit for transmitting optical energy from a light source to a desired location, comprising:

a tubular member made of silica glass;

a bore defined by said tubular member; and

a transparent plug member which stops up at least one of a light inlet end portion and a light outlet end portion of the tubular member, whereby the optical energy is transmitted through the tubular member and the bore.

4,500,168

SINGLE POLARIZATION OPTICAL FIBERS

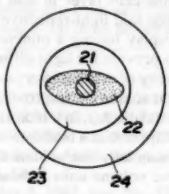
Hiroshi Kajioka, Hitachi; Toshihide Tokunaga, Kitaibaraki, and Junkichi Nakagawa, Hitachi, all of Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,265

Claims priority, application Japan, Aug. 19, 1981, 56-129804; Jan. 6, 1982, 57-682

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.34 **4 Claims**



1. In a single polarization optical fiber of the type comprising a circular core having a predetermined first refractive index; an elliptical jacket positioned on the outside of said circular core, having a predetermined second refractive index which is smaller than that of said first refractive index; and a supporting layer made of silica glass and positioned on the outside of said elliptical jacket; the improvement wherein said elliptical jacket contains dopants of B_2O_3 and P_2O_5, the content of said dopants being 5–20 mol % relative to the total material forming said elliptical jacket, said B_2O_3 being provided for decreasing the second refractive index and said P_2O_5 being provided for lowering softening temperature and viscosity thereof.

4,500,169

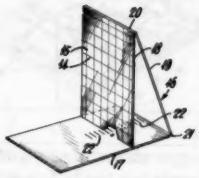
COSMETIC AND OBSERVER LINE OF SIGHT MIRROR

John H. Donnelly, 234 Eagle Rock Ave., West Orange, N.J. 07052

Filed Jul. 13, 1982, Ser. No. 397,819

Int. Cl.³ G02B 5/08; G01C 3/00

U.S. Cl. 350—288 **7 Claims**



1. A cosmetic application and observer line of sight mirror comprising a plane mirror, two sets of spaced parallel lines associated with at least part of the surface of said mirror with one set of lines being substantially horizontal and the other set of lines being at right angles thereto said sets of lines facilitating application of make-up by the user, and means including a scale operable by the user for tilting said mirror about a horizontal axis said scale enabling the user to observe the appearance presented to an observer at selected distances and elevations and said scale being calibrated in terms of the elevation and distance of an observer relative to the user and the distance of the user from the mirror.

4,500,170

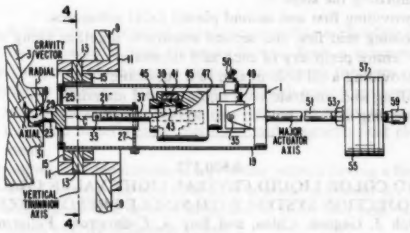
GRAVITY AND TEMPERATURE COMPENSATING REFLECTOR SUPPORT ACTUATOR

Ernest C. Montesanto, San Jose, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Jun. 14, 1982, Ser. No. 388,290

Int. Cl.³ G02B 7/18

U.S. Cl. 350—611 **12 Claims**



1. An actuator for mechanically positioning an object in variable spaced relationship with respect to a support structure, said actuator being coupled to the object at a single location and comprising:

means for effectuating small adjustments in the axial length of the actuator, and thereby in the distance between the object and the structure; and

means, substantially independent from said effectuating means, for balancing forces on said single location in a radial direction orthogonal to said axial direction;

wherein the axial adjustments and the radial force balancing are both conveyed to the object at said single location; and

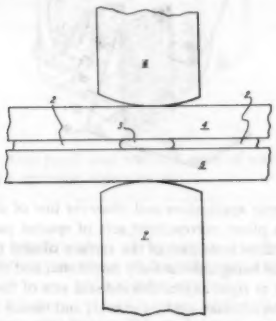
said actuator is pivotable throughout small angular excursions about a point fixed with respect to the structure but not with respect to the object.

4,500,171

PROCESS FOR PLASTIC LCD FILL HOLE SEALING

Perry A. Penz, Richardson, and Jeffrey B. Sampsell, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 2, 1982, Ser. No. 384,356
Int. Cl.³ G02F *1/13*; G02B *0/00*; A61J *5/04*; B29C *13/00*
U.S. Cl. 350—320 **7 Claims**



1. A method for fabricating plastic liquid crystal displays, comprising the steps of:
providing front and rear plastic liquid crystal display substrates;
bonding said front and rear substrates together along a portion of the periphery thereof, said bonding step leaving a fill hole gap at one point in the periphery of said substrates;
pressing first and second heated elements against said plastic substrates in the neighborhood of said fill hole, said heated elements being heated to a temperature which is greater than the melting temperature of said plastic substrates;
wherein the portion of each said element in contact with said plastic substrates comprises a spherical radius of curvature which is in the range of 10 to 100 times the width of said fill hole gap.

7. A method for fabricating a plastic liquid crystal display, comprising the steps of:
providing first and second plastic LCD substrates;
joining said first and second substrates together along the entire periphery of each said substrate;
providing a fill hole in said first substrate;
filling said substrate with liquid crystal material;
welding said fill hole to said second substrate.

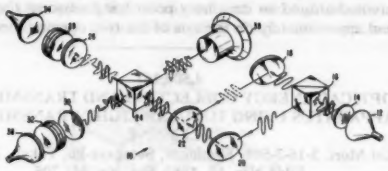
4,500,172

TWO COLOR LIQUID CRYSTAL LIGHT VALVE IMAGE PROJECTION SYSTEM WITH SINGLE PREPOLARIZER

Ralph J. Gagnon, Chico, and Roy A. Cedarstrom, Fullerton, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 334,679
Int. Cl.³ G02F *1/13*; G03B *21/00*; G02B *5/30*
U.S. Cl. 350—331 R **5 Claims**

3. A color selective prepolarizing system for liquid crystal light valve projectors comprising:
a prepolarizing beamsplitter for splitting and prepolarizing light from a source into first and second beams having first and second polarization states respectively;
first means for extracting light of a first color from said first beam;
second means for extracting light of a second color from said second beam; and
means for combining the first and second beams into a single beam having substantially two components, the first component having essentially light of a first color and first polarization state and the second component having essentially light of a second color and a second polarization state.

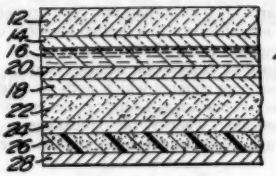


4,500,173

ELECTROLUMINESCENT LAMP FOR LIQUID CRYSTAL DISPLAY

Marshall Leibowitz, Ridgefield, and Douglas A. George, Watertown, both of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed May 2, 1983, Ser. No. 490,621
Int. Cl.³ G02F *1/133*; H05B *37/00*
U.S. Cl. 350—345 **6 Claims**



1. An improved combination electroluminescent backlight and incident light reflector for a liquid crystal display for nighttime and daytime viewing, respectively, the improvement comprising:
a liquid crystal display
a light-reflective electrode in said electroluminescent backlight arranged to reflect incident light entering and passing through said liquid crystal display, and
a thin electroluminescent layer in said electroluminescent backlight between said light-reflective electrode and said liquid crystal display having a minimal amount of phosphor selected to provide for light diffusion for improving daytime viewability of said liquid crystal display as well as to provide a light source for improving nighttime viewability of said crystal display, in which said minimal amount of phosphor is dispersed in a binder in said electroluminescent layer in substantially one volume unit of phosphor for every four to five volume units of binder.

4,500,174

ELECTROCHROMIC IMAGING APPARATUS

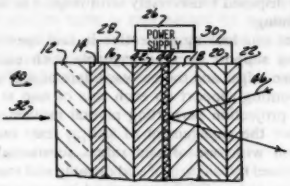
Bruce E. Conner, 510 Catherine St., Ann Arbor, Mich. 48104

Filed Jan. 5, 1983, Ser. No. 455,742
Int. Cl.³ G02F *1/25*
U.S. Cl. 350—357 **11 Claims**

1. An electrochromic imaging apparatus comprising:
a substrate formed of an optically transparent material;
a first electrode formed of an optically transparent material having an electrically conductive surface, the first electrode contacting the substrate;
a layer of a photoconductive material contacting the electrically conductive surface of the first electrode;

a layer of electrochromic iridium oxide contacting the photoconductive material layer;

a layer of a solid ionic conductive material contacting the electrochromic iridium oxide layer;



a second electrode formed of an optically transparent material having an electrically conductive surface, the electrically conductive surface of the second electrode contacting the ionic conductive material layer; and

means for selectively applying an electric field of opposite polarities across the first and second electrodes.

4,500,175

METHOD AND APPARATUS FOR LIGHT CHOPPING BY ACOUSTO-OPTIC REFRACTION

Fredrick L. Schaff, Ellicott City, Md., and Milton Gottlieb, Churchill, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 431,472
Int. Cl.³ G02F 1/11
U.S. Cl. 350—358 **13 Claims**

1. A method of refracting an optical ray comprising the steps of:

passing said optical ray through an optical medium to establish a first focal point in a quiescent mode; and

launching acoustic waves into said optical medium to induce a refractive index gradient within said optical medium, refracting the optical ray from said first focal point to at least a second focal point in an active mode.

4,500,176

METHOD AND DEVICE FOR IMPROVING A CONDUCTIVE SWITCHING GRID FOR SWITCHABLE MAGNETIC ELEMENTS

Bruce E. MacNeal, Fullerton, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

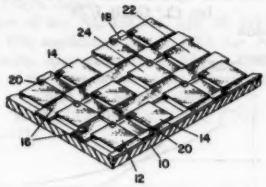
Filed May 5, 1982, Ser. No. 375,326
Int. Cl.³ G02F 1/09
U.S. Cl. 350—376 **15 Claims**

1. A magneto-optic device having a plurality of post elements formed upon a nonmagnetic substrate from a material that exhibits magnetic domain characteristics having grid-like separations between said post elements, comprising:

said material forming said post elements having a high anisotropy characteristic with a first relatively small surface region in said material having a low anisotropy characteristic;

said grid-like separations positioned between said post elements in a first and second direction;

conductor means aligned with each of said grid-like separations between said post elements in said first direction of said separation and with every other of said grid-like separations in said second direction of said separation to form intersecting conductor means, and



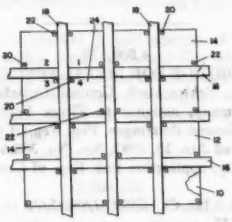
said first relatively small surface region in said material located within each of said post elements in juxtaposition to said intersecting conductor means.

4,500,177

METHOD AND DEVICE FOR CREATING SWITCHABLE REDUNDANCY WITH A MAGNETIC ELEMENT

Bruce E. MacNeal, Fullerton, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 5, 1982, Ser. No. 375,330
Int. Cl.³ G02F 1/09
U.S. Cl. 350—376 **11 Claims**



1. A method for creating redundancy within a plurality of switchable magnetic post elements formed from a magnetic material upon a nonmagnetic support, comprising the steps of:

placing a magnetic material having a high anisotropy upon said nonmagnetic material to form separations in said magnetic material and thus form said magnetic post elements;

arranging said separations in a grid-like pattern having a first set of separations in a first direction and a second set of separations in a second direction to form said post elements into quadrilateral shapes;

placing a conductive material in each of said grid-like separations in said first and second directions;

placing a first region of material in said high anisotropy magnetic material which forms said post elements that has a low anisotropy relative to said high anisotropy of said magnetic post elements, said first region placed in a corner of each quadrilaterally shaped post element;

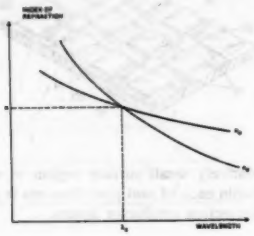
placing a second region of material in said high anisotropy magnetic material which forms said post elements that has a low anisotropy relative to said high anisotropy of said magnetic post elements, said second region placed in a corner of each quadrilaterally shaped post element opposite said first region of material wherein said second region may be used to switch said magnetic post element in addition to said first region.

4,500,178

ISO-INDEX BIREFRINGENT FILTERS

Pochi A. Yeh, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 13, 1981, Ser. No. 310,562
Int. Cl.³ G02B *5/28*
U.S. Cl. 350—404 **10 Claims**



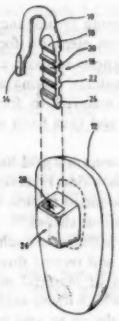
1. An optical Filter for selectively transmitting light in a passband at the wavelength λ, comprising:
- an initial polarizer with a polarization direction perpendicular to a beam path;
- a final polarizer spaced from said initial polarizer along said path and having said polarization direction; and
- a birefringent element positioned between said polarizers with an optic axis perpendicular to said path and directed approximately 45° from said polarization direction, said element having a birefringence which is zero at the wavelength λ.

4,500,179

SIDE BRIDGE FOR METAL SPECTACLES

Kurt Schönhut, Schwaebisch Gmuend-Unterbettringen, Fed. Rep. of Germany, assignor to Firma Ferdinand Menrad, Schwabisch-Gmund-Bettringen, Fed. Rep. of Germany

Filed Jun. 15, 1982, Ser. No. 388,644
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1981, 3123925
Int. Cl.³ G02C *1/00, 5/12*
U.S. Cl. 351—137 **1 Claim**



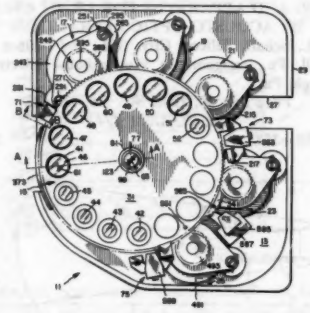
1. A side bridge for metal spectacles comprising:
- a plastic pad formed of synthetic resin;
- a mounting support formed of resilient material having a longitudinal opening therein and an axis substantially parallel to said pad;
- at least one locking projection extending generally transversely into said opening with respect to the longitudinal axis thereof, said at least one locking projection being disposed generally centrally in said opening and said opening flaring outwardly on each side of said at least one locking projection;
- a metallic bridge support having one end which is insertable axially into said opening of said mounting support; and
- a plurality of successive ridges on said one end of said bridge support disposed transversely with respect to said axis of said opening;
- said at least one locking projection in said opening of said mounting support being engageable with each of said successive ridges and the outward flare of said opening in said mounting support on each side of said at least one locking projection permitting pivotal movement of said pad about the engagement of said at least one locking projection with one of said ridges substantially in the plane defined by said axis of said opening and transverse to said ridges and said at least one locking projection.

4,500,180

MOTORIZED REFRACTION APPARATUS

Donn E. Stevens, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jul. 22, 1981, Ser. No. 285,715
Int. Cl.³ A61B *3/02*
U.S. Cl. 351—234 **24 Claims**



1. In an ophthalmic instrument including a base and one or more optical elements positionable along an optical axis;
- (a) hub means supported by said base, said hub means having an axis and including at least one cylindrical bearing surface;
- (b) a rotatable disk for supporting said optical elements, said disk including a central bearing aperture which cooperates with said cylindrical bearing surface to permit relative rotation between said disk and said hub and to radially align said disk relative to said hub axis; and
- (c) a plurality of peripheral disk support means supported by said base, each of said peripheral support means including a groove adapted to receive the periphery of said disk to axially position said disk along said optical axis and to permit relative rotation between said disk support means and said disk.

4,500,181

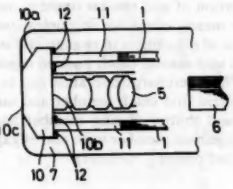
ILLUMINATING OPTICAL SYSTEM FOR ENDOSCOPES

Susumu Takahashi, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 25, 1982, Ser. No. 381,885
Claims priority, application Japan, May 26, 1981, 56-79921
Int. Cl.³ G02B *5/04, 23/02;* A61B *1/06*
U.S. Cl. 350—574 **8 Claims**

1. An illuminating optical system for endoscopes comprising a light source; a transparent body arranged in front of said light source; and a tubular transparent member having one end face adjacent to said light source and the other end face contacted with a first surface of said transparent body, refractive indices

of a first medium to be contacted with the object side surface of said transparent body, said transparent body and a second medium located between said light source and said transparent body and contacting said transparent body, when refractive index of said first medium is represented by n_1, refractive index of said transparent body is represented by n_2 and refractive index of said second medium is represented by n_3, being so selected that, conditions $n_1 > n_3$ and $n_2 > n_3$ are satisfied, said transparent body being a prism having said first surface inter-



secting at right angles with the optical axis of an objective arranged in the rear side of said transparent body and facing said objective, a reflecting surface forming an angle θ with said first surface and a second surface located forward of said first surface and parallel with said first surface, the angle θ refractive indices n_2 and n_3 and an angle ϵ of fitting said tubular transparent member to said transparent body being so selected that the entrance angle of the light from said light source onto said second surface of said transparent body is larger than a critical angle θ_1 ($\theta_1 = \sin^{-1}(n_3/n_2)$).

4,500,182

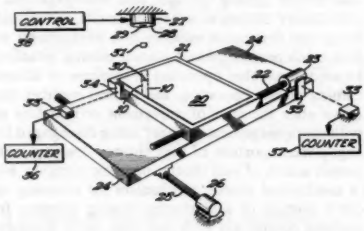
PHOTOPLOTTER

Robert W. Schumann, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Dec. 27, 1982, Ser. No. 453,481

Int. Cl.³ G03B *41/00*

U.S. Cl. 354—4 **26 Claims**



1. In a photoplotter of the type having means for supporting photosensitive media, means for generating a radiant energy pattern on said photosensitive media with said pattern generating means having a face and means for displaying an alterable pattern object on said face, and means for producing relative movement between said photosensitive media and a radiant energy pattern thereon, said relative movement being in accordance with a desired exposure trace on said photosensitive media, the improvement which comprises means for detecting a difference between actual and desired relative movement between said photosensitive media and radiant energy pattern and means responsive to said difference for selectively varying the position of said pattern object on said face of the pattern generating means to vary the position of said radiant energy pattern to compensate for said difference.

4,500,183

FILM CASSETTE AND A PHOTOGRAPHING DEVICE USING THE SAME

Kowji Tanikawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

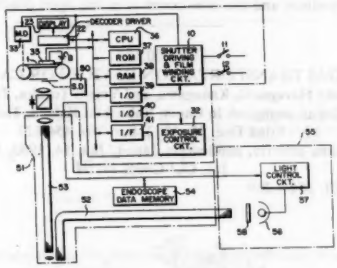
Continuation of Ser. No. 258,946, Apr. 30, 1981, Pat. No. 4,443,077. This application Jan. 6, 1983, Ser. No. 456,103

Claims priority, application Japan, May 2, 1980, 55/58988

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.³ G03B *7/24, 17/36, 17/26*

U.S. Cl. 354—21 **9 Claims**



1. A film cassette comprising:

a film case including an unexposed film chamber section, and a film take-up chamber section having a film take-up spool therein;

a film initially contained in said unexposed film chamber section and which is moved to said film take-up chamber section by being wound up on said film take-up spool; and

a semiconductor memory means provided on said film case and storing and reading out data relative to the film contained in said film case.

4,500,184

ELECTRONIC FLASH CAMERA

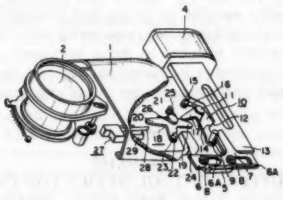
Masaaki Morizumi; Toru Kando, and Keisuke Haraguchi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,796

Claims priority, application Japan, Apr. 19, 1982, 57-55652[U]

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—149.11 **3 Claims**



1. An electric flash camera comprising:

a camera frame;

an electric flash unit movably mounted on the camera frame between an extended set position and a retracted reset position;

a lens cover movably mounted on the camera frame between an open position for exposing a camera lens and a closed position for covering the camera lens;

a power source switch positionable in an on position and an off position for controlling the electronic flash unit;

means for turning on and off the power source switch controlled by the movement of the electronic flash unit and the lens cover, the means for turning on and off the power source switch turns off the power source switch when the lens cover is in the closed position and the electronic flash unit is in the extended set position, the means for turning on and off the power source switch turns off the power source switch when the electronic flash unit is in the retracted reset position and the means for turning on and off the power source switch turns on the power source switch when the electronic flash unit is in the extended set position and the lens cover is in the open position.

4,500,185

FILM TRANSPORTATION DEVICE FOR CAMERA

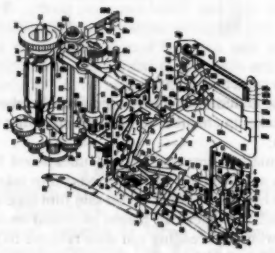
Shosuke Haraguchi, Kanagawa, and Yoichi Tosaka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,627

Claims priority, application Japan, Jan. 14, 1982, 57-4317

Int. Cl.³ G03B *19/04*

U.S. Cl. 354—209 **5 Claims**



1. A film transportation device for a camera comprising:

(a) an operating member arranged upon movement from a first position to a second position to switch said camera to a rewinding mode;

(b) a locking member for holding said operating member in said second position;

(c) a changeover member supported to be movable forward and backward and arranged to move forward in response to winding up of the camera, said changeover member being taken out of cooperating relationship with the winding operation of the camera just before the winding operation of the camera is terminated; and

(d) a spring member for urging said changeover member in the backward direction, said spring member driving said changeover member to move backward, whereby said locking member is pushed to take said locking member and said operating member out of engagement with each other.

4,500,186

SHUTTER CONTROL DEVICE FOR CAMERA

Akio Sunouchi, Tokyo; Ryuji Suzuki, Kanagawa; Masahisa Fujino, Tokyo, and Tatsuo Konno, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 389,885

Claims priority, application Japan, Jun. 22, 1981, 56-96409; Jun. 22, 1981, 56-96410

Int. Cl.³ G03B *9/34*

U.S. Cl. 354—234 **2 Claims**

1. A shutter control device for a camera, comprising:

(a) a shutter closing member having first and second catch portions;

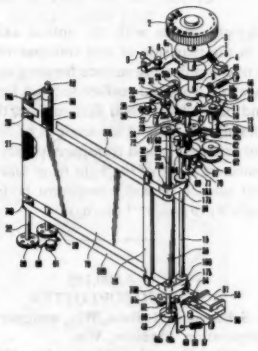
(b) a first catch member cooperative with said first catch portion of said shutter closing member;

(c) a second catch member cooperative with said second catch portion of said shutter closing member, said second catch member producing a gap between said first catch member and said first catch portion while it is in engagement with said second catch portion of said shutter closing member;

(d) a shutter opening member having an engagement portion;

(e) an engagement member cooperative with said engagement portion of said shutter opening member;

(f) charge means operative in correspondence to windup operation of the camera to engage said second catch member with said second catch portion of said shutter closing member by overcharge operation and to produce said gap between said first catch member and said first catch portion of said shutter closing member and then to engage said engagement member with said engagement portion of said shutter opening member;



(g) a first member operating in response to actuation of a camera release operation for causing said second catch member to disengage from said second catch portion of said shutter closing member, said disengagement causing said shutter closing member to actuate across said gap to bring said first catch member into engagement with said first catch portion of said shutter closing member;

(h) a second member operating in response to actuation of a camera release operation, said second member starting to move after the start of movement of said first member, with said engagement member being disengaged from said engagement portion of said shutter opening member to permit action of said shutter opening member; and

(i) a mechanical shutter mechanism for releasing said first catch portion of said shutter closing member from the latching connection with said first catch member after a predetermined time from the start of movement of said shutter opening member so that said shutter closing member runs off.

4,500,187

SHUTTER ARRANGEMENT

Takashi Endo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Jun. 29, 1982, Ser. No. 393,300

Claims priority, application Japan, Jul. 7, 1981, 56-105986

Int. Cl.³ G03B *17/38*

U.S. Cl. 354—266 **23 Claims**

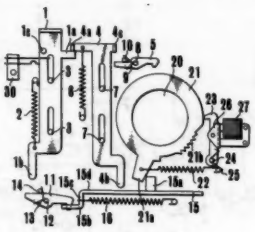
1. A shutter arrangement for a camera including a shutter with shutter blades and an electromagnet wherein closing operation of said shutter blades is controlled by said electromagnet comprising:

release means adapted to be actuated by application of a force thereto;

running means;

first bias means applying a force to move said running means;

latch means holding said running means in a predetermined position against the force of said first bias means, said latch means being responsive to the action of said release means for releasing said running means;



actuating means arranged to initiate opening operation of said shutter blades when said running means reaches a certain position; and

delay means responsive to the action of said release means thereby to be moved into abutting contact with said running means;

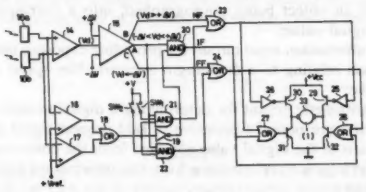
said delay means operating to delay movement of said running means thereby to restrain said actuating means from initiating opening operation of said shutter blades until normal operation of said electromagnet is achieved.

4,500,188

FOCUSING DEVICE FOR A CAMERA

Nozomu Kitagishi, Inagi, and Akira Tajima, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,717
Int. Cl.³ G03B *7/08*
U.S. Cl. 354—406 **6 Claims**



1. A focusing device for a camera, comprising

(a) a focus detecting circuit for forming a signal indicative of the state of focusing degree;

(b) a picture-taking lens driving circuit for driving a picture-taking lens to the in-focus position on the basis of the signal indicative of the state of focusing degree from said focus detecting circuit;

(c) signal forming means for forming an impossibility signal when the focus detecting operation of said focus detecting circuit is impossible; and

(d) a position detecting portion for detecting the set focus position of the picture-taking lens and forming a first signal when the set position is on the short distance focus side and forming a second signal when the set position is on the long distance focus side;

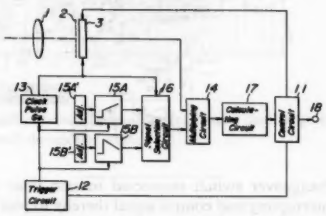
(e) said driving circuit being responsive to said impossibility signal and said first signal to drive the picture-taking lens to the long distance focus side and responsive to said impossibility signal and said second signal to drive the picture-taking lens to the short distance focus side.

4,500,189

APPARATUS FOR DETECTING THE FOCUS CONDITION OF AN IMAGING LENS

Masahiro Aoki, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 537,026
Claims priority, application Japan, Oct. 4, 1982, 57-173293
Int. Cl.³ G03B *7/08*; G01J *1/20*
U.S. Cl. 354—407 **9 Claims**



1. An apparatus for detecting a focus condition of an imaging lens comprising:

means for dividing an exit pupil of the imaging lens into sections;

means comprising plural sets of paired light receiving elements arranged to receive light fluxes transmitted through the different divided exit pupil sections;

means for generating a correction signal for eliminating the influence of an image height;

means for receiving said correction signal and for receiving output signals supplied from the light receiving elements and correcting variation in the output signals due to an image height to produce corrected signals;

means for processing the corrected signals to detect a lateral shift of two images projected on the light receiving elements; and

means for detecting a focus condition of the imaging lens on the basis of the detected lateral shift.

4,500,190

CAMERA SYSTEM INCLUDING FLASH AND STATUS INDICATING CONTROL CIRCUIT

Yoshifumi Kuroki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 384,515, Jun. 3, 1982, abandoned. This application Feb. 9, 1984, Ser. No. 577,732
Claims priority, application Japan, Jun. 15, 1981, 56-90878
Int. Cl.³ G03B *15/05*; H05B *41/32*
U.S. Cl. 354—416 **4 Claims**

1. In a camera system which includes a plurality of electrical terminals for connecting a flash device with a photographic camera, wherein said flash device includes a flash tube for producing light emissions, a condenser for accumulating a voltage of a firing level to discharge the flash tube, and means for automatically terminating light emissions from the flash tube when an appropriate exposure level is reached during flashlight photography; the improvement comprising:

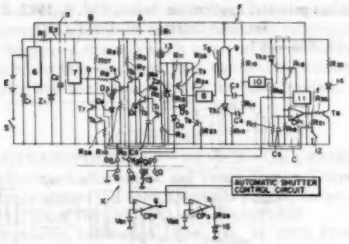
a charge completion circuit for producing a charge completion signal of a predetermined level when the voltage of the condenser reaches the firing level;

a light adjustment display circuit for producing, after termination of light emissions from said flash tube, a light adjustment display signal composed of a periodic pulse train;

a timer circuit for producing a control signal to inhibit the production of the charge completion signal for a predetermined period of time after termination of light emissions

from the flash tube and to actuate said light adjustment display circuit;

a common electrical terminal interposed between the flash device and the camera and coupled to said charge completion circuit and said light adjustment display circuit through which the charge completion signal and the light adjustment display signal are transmitted; and



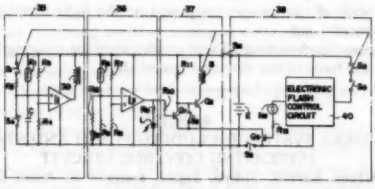
a changeover switch connected to said timer circuit for interrupting said control signal thereby to pass the charge completion signal to the camera in preference to the light adjustment display signal when the voltage across the condenser remains above the firing level after discharge of the flash tube.

4,500,191

PHOTOGRAPHY MODES SWITCHABLE CAMERA

Akira Yamanaka, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Filed Oct. 12, 1982, Ser. No. 433,613
Claims priority, application Japan, Oct. 15, 1981, 56-165416
Int. Cl.³ G03B *15/05*
U.S. Cl. 354—418 **7 Claims**



1. A camera switchable between a natural light photography mode and a flash photography mode, comprising:

an objective lens device the focal length of which is changeable;

a low brightness condition detecting means for detecting a brightness condition of an object to generate a low brightness signal upon detection of a low brightness condition;

a switching means for switching said camera from the natural light photography mode to the flash photography mode in response to the low brightness signal;

a control means for causing said detecting means to generate the signal at different brightness conditions in accordance with the change in the focal length so that the switching of said camera to the flash photography mode is effected with a higher brightness condition in the case of a longer focal length;

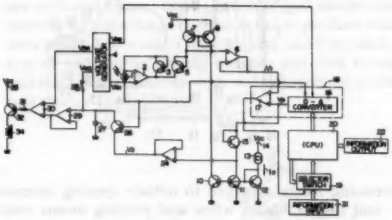
an electronic flash control circuit including means for charging and storing electric energy for flash photography; and means for disabling the switching of said camera by said switching means to the flash photography mode until the charge on said storing means has been completed.

4,500,192

AUTOMATIC EXPOSURE CONTROLLER FOR A CAMERA

Masafumi Yamasaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 356,125, Mar. 8, 1982, abandoned. This application Aug. 29, 1983, Ser. No. 527,504
Claims priority, application Japan, May 27, 1981, 56-81587
Int. Cl.³ G03B *7/093*
U.S. Cl. 354—427 **8 Claims**



1. An automatic exposure controller for a camera comprising:

photometry request means for generating a request signal requesting a photometry measurement;

a light sensing element for generating an analog voltage signal representing brightness of the object to be photographed;

compression means for logarithmaically compressing said analog signal;

an analog-to-digital converter for converting the analog signal, in logarithmically compressed form from said compression means which signal corresponds to the brightness of an object being photographed, into a corresponding digital value;

an information input circuit for providing exposure information relating to a diaphragm aperture, film speed or the like;

an arithmetic circuit for determining a digital version of an exposure period responsive to said request signal on the basis of the digital value supplied from the converter and the exposure information from the information input circuit;

a storage circuit for storing the digital version of the exposure period generated by said arithmetic circuit;

means for generating a shutter release signal;

a digital-to-analog converter for converting the digital version of the exposure period stored in the storage circuit prior to a shutter release operation as determined by the arithmetic circuit into a corresponding analog version in response to said shutter release signal;

a transistor for providing a logarithmically expanded output current of the output voltage developed by the digital-to-analog converter;

a capacitor for integrating the output current from the transistor upon the initiation of an exposure circuit;

an exposure decision circuit for determining the end of an exposure period in response to an integrated voltage across the capacitor reaching a given value; and

means responsive to said decision circuit for generating a shutter closing signal.

4,500,193

INDICATING APPARATUS FOR CAMERA

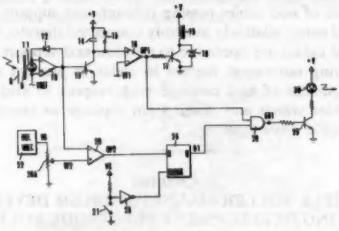
Ryoichi Suzuki, Kanagawa, and Ryuji Tokuda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 250,687, Apr. 3, 1981, abandoned. This application Jan. 10, 1983, Ser. No. 456,786

Claims priority, application Japan, Apr. 7, 1980, 55-45958

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—471 **10 Claims**



1. A camera comprising:

an auxiliary aperture for opening partially to a pre-open condition during a measuring mode, for completely closing at the start of an exposure mode and then for opening fully during an exposure;

an auxiliary aperture light measuring system having a light sensing element for measuring the light coming from the object through the auxiliary aperture;

an indicating signal producing element for producing an indicating in response to the output of the light sensing element; and

an indicating element for assuming a first indicating state in response to the indicating signal;

latch means for latching the indicating signal in response to a shutter release operation so as to maintain the output of the indicating element regardless of changes in light measured by said auxiliary light measuring system when said auxiliary aperture closes completely at the start of the exposure mode and then opens during an exposure; and

first means for bringing the indicating element into another indicating state in response to a shutter closing operation.

4,500,194

DEVICE FOR REGENERATING THE CARRIER PARTICLES OF A TWO-COMPONENT DEVELOPER CONSISTING OF CARRIER PARTICLES AND TONER

Joseph Knott, Tutzing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

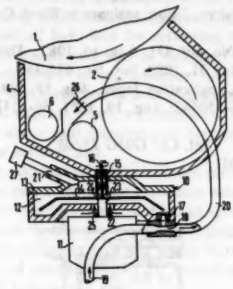
Filed Apr. 5, 1982, Ser. No. 365,391

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115331

Int. Cl.³ G03G *15/06*

U.S. Cl. 355—3 DD **16 Claims**

1. Apparatus for regenerating a developer particulate mix comprising carrier and toner particles contained in a developer unit adapted to deposit toner particles on an image bearing member comprising a chamber, an intake passage means for conducting said mix from said developer unit to said chamber, means for swirling said mix in said chamber in order to effect regenerative stripping of toner crust formations from carrier particles, and a discharge passage means for conducting regenerated mix from said chamber, said discharge passage means having an outlet end connected to a carrier line containing a pressurized air flow for conducting regenerated mix there-



through, said carrier line leading from said discharge passage means to said developer unit.

4,500,195

IMAGE FORMING APPARATUS AND A UNIT DETACHABLY USED IN THE SAME

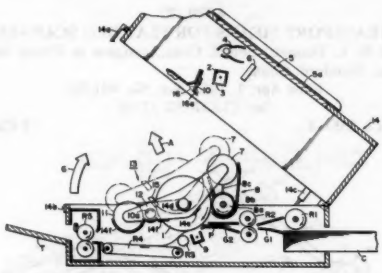
Nagao Hosono, Chofu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 321,077, Nov. 13, 1981, abandoned. This application Jan. 30, 1984, Ser. No. 575,080

Claims priority, application Japan, Nov. 22, 1980, 55-165069

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **36 Claims**



1. An image forming apparatus, comprising:

a process unit for forming images;

a main assembly having means for actuating said process unit to operate for image formation, wherein said process unit is receivable into said main assembly;

process means provided in said process unit and comprising a photosensitive member and means actable thereon for repetitive image formation, for cooperating with said actuating means of said main assembly to repetitively form an image on an image receiving material; supporting means for supporting said process means as a unit; and means for providing a representation of a property of said process means for use in forming said repetitive images on the image receiving material, effected by the cooperation of the means of said main assembly and said process means within said unit; and

control means coupled to said process means for controlling said process means within said unit in accordance with the property representation from said representation means.

4,500,196

PHOTOCONDUCTIVE ELEMENT CLEANING APPARATUS AND RESIDUAL TONER COLLECTING APPARATUS

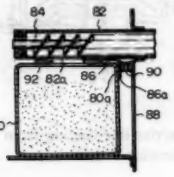
Akira Shimura, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 406,831, Aug. 10, 1982,. This application May 31, 1984, Ser. No. 616,340

Claims priority, application Japan, Aug. 19, 1981, 56-130663; Aug. 19, 1981, 56-130662; Aug. 19, 1981, 56-123285; Dec. 19, 1981, 56-189589

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—3 DD **11 Claims**



1. A toner collecting apparatus for collecting residual toner removed from a photoconductive element, comprising:

a toner discharging means which includes an opening for discharging the removed toner from a cleaning unit;

a removable container formed with a mouth through which the removed toner discharged from the toner discharging means through the opening is collected in said container;

a closure mechanism for positioning the container relative to the toner discharging means and blocking the opening of the toner discharging means when the container is removed from the toner discharging means.

4,500,197

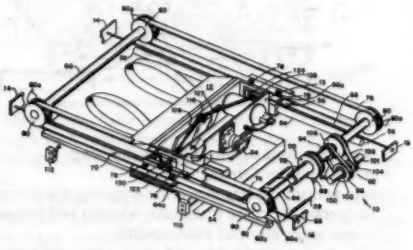
TRANSPORT MEANS FOR FLAT BED SCANNER

Hugh St. L. Dannatt, Bethel, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 1, 1983, Ser. No. 481,507

Int. Cl.³ G03G *15/28*

U.S. Cl. 355—8 **5 Claims**



1. A scanning carriage assembly for use in a photocopy machine or similar reprographic reproducing apparatus, said assembly comprising:

(a) a pair of elongate parallel spaced apart guides,

(b) a support carriage extending between each of said guides and including means connecting said carriage to said guides for movement therealong between fixed end positions,

(c) electro-optical means mounted on said support carriage in position to scan a document as said carriage moves between said fixed positions,

(d) a pair of flexible drive members mounted in juxtaposition to said parallel guides and connected to said carriers for moving said carriers on said guides between said fixed end positions,

(e) means for driving said flexible drive members in opposite directions, and

(f) a pair of stabilizing cables fixedly connected to a suitable frame portion of the photocopy machine and extending at least from one of said fixed end positions to the other thereof, each of said cables commencing adjacent said fixed end of one of said parallel guides and terminating adjacent the other end of the other of said parallel guides, both of said cables passing through said support carriage and being relatively movably connected thereto, whereby said cables are operative to stabilize said support carriage during movement thereof in order to prevent any misalignment of said carriage with respect to said parallel guides which may result from slippage or creep of said flexible drive members.

4,500,198

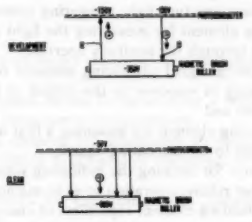
MULTIPLE ROLLER MAGNETIC BRUSH DEVELOPER HAVING DEVELOPMENT ELECTRODE VOLTAGE SWITCHING

Raymond A. Daniels, Thornwood, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,577

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—14 D **4 Claims**



1. A two-cycle xerographic device having a reusable photoconductor with at least one image area and one interimage area thereon, and a plurality of xerographic facilities for performing the charging, imaging and transferring functions, said device including:

a multiroller magnetic brush developer and development electrode voltage source means therefor; and

control means responsive to the instantaneous position of said interimage area relative the position of each of the individual rollers of said magnetic brush, and operable to control said voltage source means so as to change an individual roller's voltage from a development mode to a cleaning mode as the leading edge of the interimage area encounters each of said individual rollers of said developer during the second cycle of the device.

4,500,199

ELECTROPHOTOGRAPHIC APPARATUS COMPRISING DETECTION ASSEMBLY FOR DETECTING RECORD PAPER SHORTAGE

Muneo Kasuga; Akira Shimizu, and Tadashi Nishio, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1983, Ser. No. 483,171

Claims priority, application Japan, Apr. 13, 1982, 57-60276

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 CU **10 Claims**

1. An electrophotographic apparatus of the retention-type for forming a plurality of duplicated copies from a single latent image of a document, the apparatus comprising:

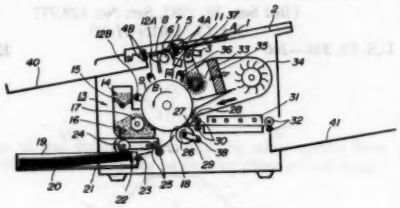
a photosensitive member, said photosensitive member being movably arranged;

means for substantially uniformly charging said photosensitive member;

means for projecting an optical image of the document to be duplicated onto the uniformly charged photosensitive member so as to form an electrostatic latent image thereon corresponding to the document;

means for developing the electrostatic latent image with toner particles to form a toner image;

means for transferring the developed toner image onto a record paper at a transfer section;



means for feeding the record paper through the transfer section; and

means for fixing the transferred toner image to form a duplicated copy;

means for detecting the number of remaining record papers in a paper supplying means; and

means for producing a paper shortage signal when the number of remaining record papers is decreased to a predetermined number slightly larger than the maximum number of duplicated copies which can be formed from a single latent image.

4,500,200

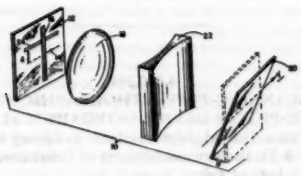
ELECTRO-OPTIC SENSOR FOR MEASURING ANGULAR ORIENTATION

William A. Kleinhans, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 206,744, Nov. 14, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 401,758

Int. Cl.³ G01B *11/26;* **G01C** *1/00*

U.S. Cl. 356—152 **7 Claims**



1. Apparatus for measuring angular displacement about a selected axis, comprising:

an array of photodetectors disposed along a line on a planar surface, wherein said planar surface is maintained substantially parallel to an axis plane containing said selected axis and a second axis orthogonal to said selected axis, and wherein said array line is substantially perpendicular to said selected axis;

a source of light disposed on said planar surface adjacent to a selected point on said array line;

optical means for transmitting light received from said source, wherein said transmitted light is collimated by said optical means, wherein said planar surface is at the focal plane of said optical means and wherein said optical means, said light source and said planar surface are mounted in fixed relationship to each other;

a reflecting reference flat mounted a, for receiving said transmitted light and for reflecting it back through said optical means and into an image of said source on said photodetector array, wherein the linear displacement along said array line of said image, relative to the position of said selected point, is a measure of the angular displacement about said selected axis between said flat and said planar surface; and

wherein said optical means includes means for spreading said image into a line image extending substantially perpendicular to said array line, said image spreading means having no more than about enough diverging effect than is necessary to maintain said line image in registration with said array of photodetectors for limited angular displacement about said second axis.

4,500,201

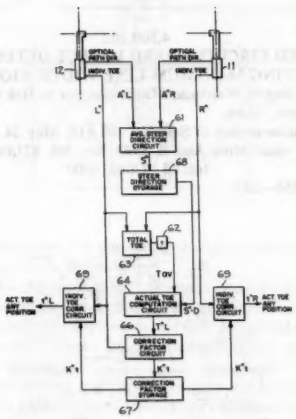
INDIVIDUAL TOE MEASURING SYSTEM

Melvin H. Lill, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 261,445, May 5, 1981, abandoned. This application Oct. 12, 1983, Ser. No. 540,911

Int. Cl.³ G01B *11/26, 5/255*

U.S. Cl. 356—152 **6 Claims**



1. A method of measuring toe for wheels supporting a vehicle chassis wherein the wheels include pairs of non-steerable and steerable wheels, utilizing a pair of alignment heads adapted to be mounted on ones of the wheels and providing signals indicative of the individual toe of the wheels on which the heads are mounted, and an optical system incorporated in each head having an aimable optical axis extending therefrom, comprising the steps of

mounting an alignment head on each of the non-steerable wheels,

aiming each optical axis in a fixed direction at separate ones of a pair of points equidistant from a point on the centerline of the vehicle chassis,

providing an electrical signal indicative of the angular departure of each aimed optical axis from the plane of the non-steerable wheel on which the respective head is mounted,

combining the angular departure signals and providing and storing an average rolling direction value for the non-steerable wheels,

calculating a value indicative of the total toe of the non-steerable wheels utilizing the individual toe signals,

combining one-half of the total toe value with the average rolling direction value to obtain an actual toe value,

comparing the actual and individual toe values to obtain a toe correction value,

removing the alignment heads from the non-steerable wheels and mounting them on the steerable wheels,

aiming each optical axis in a fixed direction at separate ones of a pair of points equidistant from the centerline of the vehicle chassis approximately at the position of the non-steerable wheels,

providing an electrical signal indicative of the angular departure of each aimed optical axis from the plane of the steerable wheel on which the respective head is mounted,

calculating a value indicative of total toe of the steerable wheels utilizing the steerable wheel individual toe signals,

combining one-half of the steerable wheel total toe and the angular departure signals with the stored non-steerable wheel rolling direction signal so that an actual toe angle signal for each steerable wheel is obtained which is referenced to the non-steerable wheel average rolling direction,

comparing the actual toe for one steerable wheel with the individual toe for that wheel to obtain a steerable wheel toe correction factor, and

storing the steerable wheel correction factor for application to steerable wheel individual toe for other steering angles and toe adjustments.

4,500,202

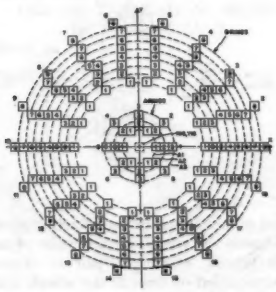
PRINTED CIRCUIT BOARD DEFECT DETECTION OF DETECTING MAXIMUM LINE WIDTH VIOLATIONS

Bruce E. Smyth, Waltham, Mass., assignor to Itek Corporation, Lexington, Mass.

Continuation-in-part of Ser. No. 381,618, May 24, 1982,. This application Aug. 8, 1983, Ser. No. 521,045

Int. Cl.³ G06K *9/00*

U.S. Cl. 356—237 **4 Claims**



1. The method of determining in patterned images of lines and spaces of predetermined line width and spacing the presence of lines exceeding the maximum allowable predetermined line width comprising the steps of:

(a) forming pixels comprising a plurality of electronic signals corresponding to the patterned image;

(b) arranging said pixels in two concentric rings of pixels;

(c) said rings including an inner ring having a diameter slightly greater than the maximum allowable predetermined line width and an outer ring substantially greater than the maximum allowable predetermined line width;

(d) determining the following:

(i) if all pixels on said inner ring are in a logic state corresponding to a line image;

(ii) if less than a predetermined number X of pixels on said outer ring are in the same logic state as (i) above;

(iii) if less than Y number of selected opposite pairs of pixels on said outer ring are in identical logic state.

4,500,203

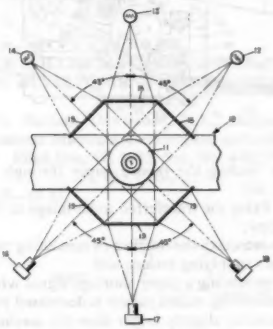
METHOD AND APPARATUS FOR INSPECTING ARTICLES

Robert J. Bieringer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 30, 1982, Ser. No. 429,777

Int. Cl.³ G01N *21/90*

U.S. Cl. 356—240 **23 Claims**



1. The method of inspecting the shape of a generally cylindrical or oval article which comprises the steps of illuminating the said article with a series of three lamps located at three different angles along one side of said article, scanning the profile of the illuminated article with a series of three similar photosensors located in fixed juxtaposition at three different complemental angles along the other side of said article during operation of the juxtaposed lamps, measuring the extremities of each of the three profiles of said article at the same planar elevation to permit calculation of the major and minor axes of said article independently of orientation, and rejecting the said article as defective when the deviation of the major and minor axes exceeds established maximum or minimum dimensions.

4,500,204

SCANNING-TYPE LITHOGRAPHIC AND IMAGE-PICKUP DEVICE USING OPTICAL FIBER

Mutsuo Ogura, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Apr. 2, 1982, Ser. No. 364,911

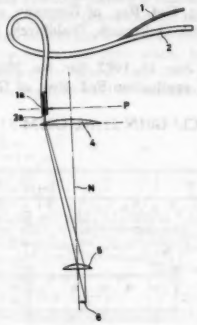
Claims priority, application Japan, Apr. 21, 1981, 56-61018; Apr. 21, 1981, 56-61019

Int. Cl.³ G01N *21/63*

U.S. Cl. 356—318 **26 Claims**

1. A scanning-type lithographic and image-pickup device, comprising at least one projecting optical fiber, at least one picking-up optical fiber, a scanning mechanism for causing the terminal portions of said projecting and picking-up optical fibers to produce a scanning motion, and an optical system for guiding the light projected from said projecting optical fiber to the surface of a given object and then guiding the light reflected on said surface through the same light path into said

picking-up optical fiber, either of said projecting optical fiber and picking-up optical fiber being positioned in the plane of



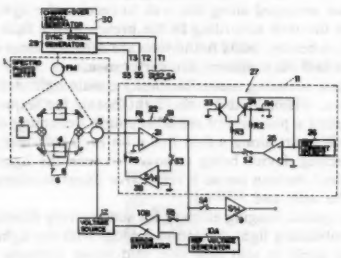
real image of said optical system and the other optical fiber being positioned in front of or behind the plane of real image.

4,500,205

SPECTROPHOTOMETER

Shinichiro Watanabe, Tokyo, Japan, assignor to Japan Spectroscopic Co., Ltd., Hachioji, Japan

Filed Feb. 10, 1983, Ser. No. 465,683
Claims priority, application Japan, Feb. 15, 1982, 57-23248
Int. Cl.³ G01J 3/42
U.S. Cl. 356—325 7 Claims



1. In a spectrophotometer of the type comprising a radiation source, a reference cell, a sample cell, a radiation detector which produces an electrical output, and beam path switching means for directing monochromatic radiation of varying wavelengths from the source alternately to the reference and sample cells to form reference and sample beams and directing in synchronism the reference and sample beams to said detector, wherein an output of said detector which responds to the reference beam is fed back to said detector such that said output may be equal to a reference voltage upon measurement of a sample material in said sample cell at all wavelengths, whereby an output of said detector which responds to the sample beam represents the transmittance of the sample for each wavelength,

the improvement comprising

a current-voltage converting amplifier connected to the output terminal of said detector,

a logarithmic amplifier connected to the output terminal of said detector, and

synchronization switching means for alternately rendering said current-voltage converting amplifier and said logarithmic amplifier operative in synchronism with the operation of said beam path switching means,

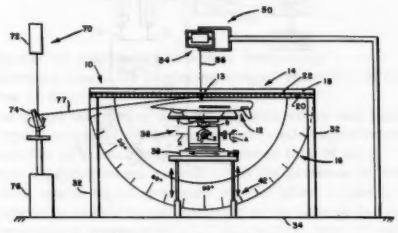
whereby selection is made by means of said synchronization switching means in synchronism with the operation of said beam path switching means between at least two states, a first state where an output of said detector is directly fed to said logarithmic amplifier without passing said current-voltage converting amplifier and a second state where an output of said detector is directly fed to said current-voltage converting amplifier without passing the logarithmic amplifier.

4,500,206

OPTICAL SYSTEM FOR MEASURING SHADOWGRAPH DATA

Eugene O. Cole, Tucson, Ariz., and Vahan H. Yeterian, Lompoc, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 15, 1982, Ser. No. 434,671
Int. Cl.³ G01B 11/24
U.S. Cl. 356—376 10 Claims



1. An optical system for measuring shadowgraph data from an object under study comprising:

first means fixedly secured to a stationary surface for providing angular markings from 0 to 360 degrees;

second means fixedly secured to said first means and situated perpendicular thereto for providing angular markings from 0 to 90 degrees;

said first and second angular marking means being joined together in order to form an imaginary spherical configuration in which said object under study can be positioned;

means for positioning said object under study within said imaginary spherical configuration, said object positioning means providing movement of said object under study about three independent axes as well as linear movement along said three axes;

means for aligning said object under study with respect to said first and second angular marking means;

means for providing a beam of electromagnetic radiation adjacent said second angular marking means and for illuminating preselected angular markings on said second means; and

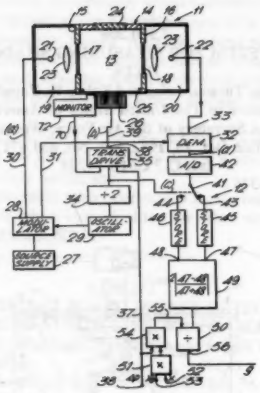
means operably associated with said object positioning means for rotating said object about an axis passing through the center of and perpendicular to said first angular marking means;

whereby upon rotation of said object under study about said axis passing through said first angular marking means, shadowgraph data angular measurements are obtained as said electromagnetic beam intersects said angular markings of said second means and said object under study.

4,500,207
NON-DISPERSIVE OPTICAL DETERMINATION OF GAS CONCENTRATION

Adrian J. Maiden, Stockport, England, assignor to Ferranti, PLC, England

Filed Nov. 8, 1982, Ser. No. 440,040
Claims priority, application United Kingdom, Nov. 14, 1981, 8134389
Int. Cl.³ G01N *21/61*
U.S. Cl. 356—409 13 Claims



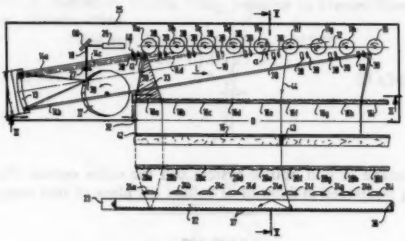
1. Apparatus for non-dispersive optical determination of the concentration of an identifiable gas in an atmosphere comprising a sample chamber arranged to communicate with the atmosphere by flow limiting means in the form of a plug of porous material operable to limit the rate of gas flow between the chamber and atmosphere to a value whereby after a pressure change is induced in the chamber and for a time period thereafter there is no substantial restoration of gas pressure within the sample chamber towards atmospheric, transducer means operable to change the pressure of the gas mixture in the sample chamber by a predetermined amount between first and second pressures, a source of a beam of radiation at a wavelength absorbed by the identifiable gas only of the mixture, window means by which the radiation is passed through the sample chamber, a detector responsive to radiation at said wavelength after passage through the sample chamber to produce a signal related to the intensity level of the radiation detected, and signal processing means operable to derive a signal representing the fractional change in intensity ($\Delta I/I$) of the detected radiation due to the pressure change in the sample chamber and calculate from said derived signal, the chamber pressure change (Δp), radiation path length through the gas mixture (x) and an absorption constant characteristic of the specific gas (α_o), a representation of the gas concentration g in accordance with the formula

$$g = -\Delta I/(I \cdot \Delta p \alpha_o x).$$

4,500,208
APPARATUS FOR SEEKING FAULTS IN WIDE MATERIAL WEBS

Erwin Sick, Icking, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Jun. 16, 1982, Ser. No. 388,860
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125189
Int. Cl.³ G01N *21/88;* G01M *11/08*
U.S. Cl. 356—431 31 Claims



1. Apparatus for seeking faults in wide material webs during movement of the same, the apparatus comprising:

beam scanning means for scanning a sharp light beam across the web transverse to the direction of web movement to examine the web across its full width with full coverage of the scanning beam;

light receiving means including photoelectric converter means arranged along the web to receive the light beam from the web according to the presence of a fault in the web, whereby faults in the web are detected from signals from said photoelectric converter means;

said beam scanning means including a main light deflecting device, illuminated by the light beam, for sequentially scanning a plurality of subsidiary light deflecting devices spaced apart along a first line with each subsidiary light deflecting device being arranged to scan the light beam incident thereon across a respective linear scanning zone on the web; and

a main optical imaging element for successively illuminating the subsidiary light deflecting devices with the light beam at an angle to said first line, said linear scanning zones jointly covering the full width of the web.

4,500,209
FEED MIXING APPARATUS

Marvin B. Steiner, and Roy I. Steiner, both of Orrville, Ohio, assignors to Sevenson Company, Orrville, Ohio

Continuation-in-part of Ser. No. 253,307, Apr. 13, 1981, Pat. No. 4,444,509. This application Feb. 10, 1984, Ser. No. 578,853
Int. Cl.³ B01F *15/02, 9/08*
U.S. Cl. 366—157 8 Claims

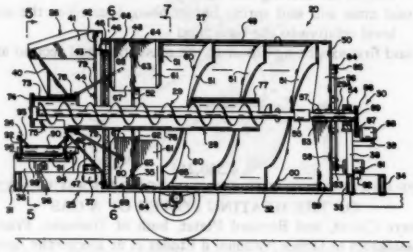
1. In a mixing apparatus for livestock feed constituents having a frame, a cylindrical drum with front and rear walls and internal spiral mixing and conveying blades mounted for unidirectional rotation on said frame, said drum front wall having an axial opening, a hopper assembly supported on said frame in front of said drum, a feed pipe extending from said hopper assembly and into said drum through said axial opening and axially of said spiral mixing and conveying blades, and a feeder screw auger shaft mounted for bidirectional rotation in said feed pipe, the improvements wherein:

said drum carries a circular shroud ring projecting in front of said drum front wall and terminating adjacent said hopper assembly;

the outer face of said drum front wall has thereon, within said shroud ring, a series of radial paddles;

said hopper assembly has front, side and rear walls forming

a box for receiving said feed constituents, said hopper assembly rear wall, below said box, terminating at a substantially circular opening having a diameter slightly less than the diameter of said drum shroud ring and substantially greater than said drum front wall axial opening, said hopper assembly front and side walls, below said box, extending downwardly below said feed pipe forming a chamber for holding said feed constituents; and,



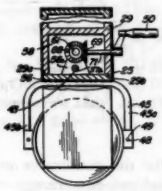
said feed pipe has a front segment projecting in the front of said hopper assembly and a semi-cylindrical upwardly opening medial segment extending from said hopper assembly and through said hopper assembly and through said hopper assembly rear wall circular opening and said drum front wall axial opening, said projecting feed pipe front segment having an opening for discharging mixed feed from said drum toward a delivery point.

4,500,210

MIXING APPARATUS

Erik O. Vilen, La Grange Park, Ill., assignor to Blakeslee, A division of Blako, Inc., Cicero, Ill.

Filed May 20, 1983, Ser. No. 496,544
Int. Cl.³ B01F *7/30*
U.S. Cl. 366—207 **8 Claims**



1. For use with a mixing apparatus, a bowl support arrangement which is self-aligning with respect to the mixing apparatus, said support arrangement comprising:

a bowl support member having:

(a) a yoke portion adapted to receive and hold a mixing bowl,

(b) a base portion adapted to be raised and lowered as desired by the user thereof, and

(c) a single guide portion defining an aperture extending inwardly from said base portion into the mixing apparatus;

a guiding means comprising a guide rod mounted inwardly of said mixing apparatus and passing through said aperture and defining a single vertically extending guide rail for said bowl support member, said guiding means engageable by said single guide portion of said bowl support member for raising and lowering said bowl support member as desired, and

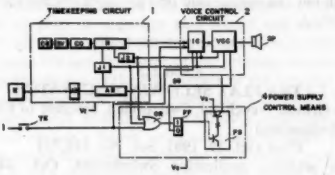
a bearing surface means engageable by said base portion of said bowl support member, with said guiding means and said bearing surface means cooperating with said bowl support member to maintain and to support said bowl support member when the mixing apparatus is operative and to provide a load bearing surface between said bearing surface means and said base portion during the mixing operation.

4,500,211

AUDIBLY ANNOUNCING APPARATUS WITH POWER SAVING FEATURE

Shintaro Hashimoto, Ikoma; Sigeaki Masuzawa, Nara; Shinya Shibata, Yamatokoriyama; Hiroshi Tsuda, Uji, and Masahiro Nakano, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 129,653, Mar. 12, 1980, abandoned.
This application Apr. 30, 1982, Ser. No. 373,680
Claims priority, application Japan, Mar. 12, 1979, 54-29024
Int. Cl.³ G04B *21/08, 1/00*
U.S. Cl. 368—63 **9 Claims**



1. An audibly announcing timepiece comprising:

timekeeping means for producing a signal indicative of the time of day;

alarm means monitoring said signal produced by said timekeeping means for producing an alarm enable signal representative of the occurrence of a desired time of day;

speech synthesis means responsive to the presence of said alarm enable signal produced by said alarm means and responsive to said signal indicative of the time of day for generating a representation of information stored therein in an audible synthetic speech voice;

a power supply;

enablement means for selectively supplying power from said power supply to said speech synthesis means when said alarm signal is present in order to enable said speech synthesis to produce said audible voice;

said enablement means disconnecting power to said speech synthesis means when said audible sounds are not desired.

4,500,212

EXPANDED INTERVAL TIMER DRIVE MECHANISM

Guy A. Wojtanek, Franklin Park, Ill., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 2, 1984, Ser. No. 627,128
Int. Cl.³ G04F *8/00*
U.S. Cl. 368—108 **7 Claims**

1. A program timer having a plurality of timing cams located on a rotating member and controlling the operation of switches in a predetermined program, characterized by:

a ratchet ring mounted on said rotating member for movement therewith, said ratchet ring having a first group of ratchet teeth of a first major radius and a second group of ratchet teeth of a second major radius less than said first major radius;

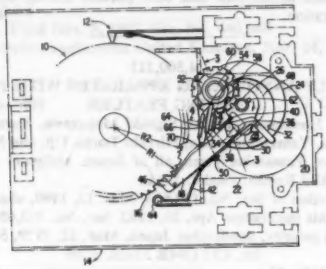
a drive pawl;

means for yieldably biasing said drive pawl against said ratchet ring;

drive means for linearly reciprocating said drive pawl substantially tangential to said ratchet ring; and

lifting means operating against the force of said biasing means for intermittently lifting said drive pawl away from the center of said rotating member to a level between said

second major radius and said first major radius so that said drive pawl cannot engage said second group of ratchet



teeth but can engage said first group of ratchet teeth when so lifted.

4,500,213

ULTRA-FLAT SELF-WINDING WATCH

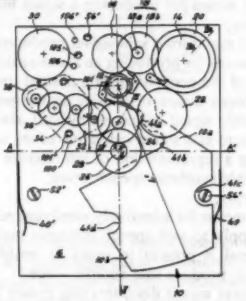
Maurice Grimm, Neuchatel, Switzerland, assignor to Ebauches, S.A., Switzerland

Filed Oct. 19, 1981, Ser. No. 312,731

Claims priority, application Switzerland, Oct. 24, 1980, 7961/80

Int. Cl.³ G04B *5/02*

U.S. Cl. 368—208 **7 Claims**



1. A self-winding watch comprising a case with a back and, within said case:

a first zone including analogue time indicating means rotating about a first axis perpendicular to the back; and

a second zone at least partially located between said first zone and said back and including in a first region, a spring barrel having a thickness defined by spaced apart planes substantially parallel to the case back, an escapement-balance wheel unit, a gear train drivably interconnecing said spring barrel, said time indicating means and said escapement-balance wheel unit, and an arm located in said second zone and between the planes defining the thickness of the spring barrel, said arm having a longitudinal axis and first and second ends, said first end being pivotally mounted about a second axis perpendicular to the back, which is offset with respect to the first axis, and in a second region, an oscillating mass which is fixed to the second end of said arm to form therewith a winding weight for driving said spring barrel;

said mass and said spring barrel being located at the same level relative to the back; and

said first axis being closer to the mass than said second axis.

4,500,214

APPARATUS FOR THE CONTINUOUS MEASUREMENT OF THE HEATING POWER OF A GAS

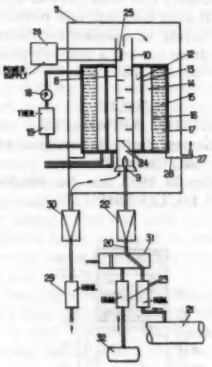
Pierre Calvet, and Bernard Platet, both of Toulouse, France, assignors to Office National d'Etudes et de Recherche Aerospatiales, Llon sous Bagneau, France

Filed Sep. 27, 1982, Ser. No. 424,238

Claims priority, application France, Oct. 5, 1981, 81 18722

Int. Cl.³ G01N *25/22*

U.S. Cl. 374—36 **10 Claims**



1. An apparatus for the continuous measurement of the heating power of a fuel gas, comprising:

a calorimeter;

an open cell in said calorimeter having a lower part and an upper part;

a burner located in and surrounded by said lower part and means for supplying the burner and the cell respectively with fuel gas and combustion air at a predetermined pressure and feedrate, said calorimeter having an external wall defining an annular space with a wall of said cell;

means for maintaining said external wall at a constant temperature;

a dividing wall parallel to said external wall and partitioning said space into a closed internal enclosure and a closed external enclosure having thicknesses which are small as compared with their other dimensions, said internal and external enclosures being filled with respective quantities of a common measurement gas and constituting a heat transmission path from said cell to said external wall; and

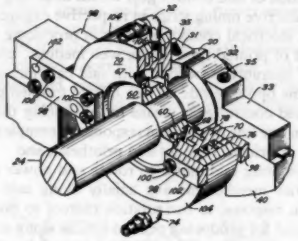
a differential gas thermometer arrangement for measuring the difference between the temperature of said common gas in said external enclosure and in said internal enclosure to thereby determine the heating power of said fuel gas.

4,500,215

ICE BEARING ASSEMBLY

Timothy C. Rusboldt, 338 Hickory St., Michigan City, Ind. 46360

Filed Sep. 1, 1983, Ser. No. 528,548
Int. Cl.³ F16C *37/00*
U.S. Cl. 384—319 **14 Claims**



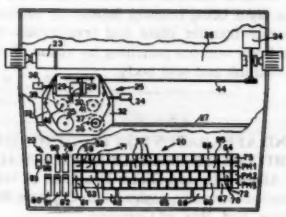
1. An ice bearing assembly having a rotatably supported member for rotation in the assembly, said assembly comprising at least one centering means disposed around said supported member and at least one ring member disposed around said centering means and defining a chamber therebetween, a means for injecting a freezable fluid into said chamber for freezing therein, a means for cooling said ring member to a temperature sufficient to cause freezing of said fluid, whereby said centering means slidably engages said frozen fluid during rotation of the supported member, and alignment bearing assemblies for said supported member, having open and closed positions and being spaced apart along the axis of said supported member, said closed position for aligning and supporting the supported member before injection of said fluid into said chamber and before said fluid has frozen, and said open position for allowing free movement of the supported member.

4,500,216

ELECTRONIC TYPEWRITER

Flippo Demonte, Borgofranco, and Mario Figini, Borsco Marengo, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 58,202, Jul. 17, 1979, abandoned. This application Oct. 13, 1981, Ser. No. 310,964
Claims priority, application Italy, Jul. 18, 1978, 68695 A/78
Int. Cl.³ B41J *19/64, 5/30*
U.S. Cl. 400—8 **6 Claims**



1. In an electronic typewriter comprising a keyboard having alphanumeric keys for entering characters of words and space means for entering spaces between said words and a print unit for printing the entered characters, the combination comprising: justification selecting means of the keyboard actuatable between an inoperative state and an operative state, means for defining in sequence each printing point of the entered characters along a printing line, end margin positioning means for storing the position of an end margin of the printing line, means for fixing an editing region on the printing line wherein the entered characters should be edited to have the last character of the printing line justified with respect to the end margin of the printing line, means for confronting the printing point of the entered characters defined by said defining means with respect to said region, a line store for sequentially storing the printing points of the printing line and associated characters to be printed in said printing points, means responsive to the operative state of said justification selecting means and to said confronting means for causing the print unit to print immediately in sequence the entered characters on said printing points whether said points are external to the editing region and for storing without printing said entered characters in said line store whether the defined printing points are internal to said editing region, means responsive to said confronting means and to the entered characters to complete printing of all characters of a last word, even in the case when part of said characters of the last word are internal to the editing region and to actuate storage without print only after a space adjacent to the last word has been entered by said space means, means for modifying the printing points of stored and not printed characters along the printing line and service keys actuatable to cause the print unit to print in sequence said stored and not printed characters on the modified printing points of said editing region to obtain the last character of the printing line correctly justified with respect to the end margin of the printing line.

6. An electronic typewriter comprising a keyboard having alphanumeric keys actuatable for entering characters to be printed and having a heavy print selecting member, a serial print unit movable along a plurality of printing points of a printing line of a sheet, print control means causing said print unit to print the entered character on its printing point of the sheet, wherein said print control means respond to the code of each actuated alphanumeric key and to an actuated position of said heavy print selecting member to cause the print unit to print the entered character on its printing point and to repeat the print of said entered character after the print unit has been displaced through a predetermined small distance with respect to its printing point in order to give the appearance of heavy print, code generating means responsive to actuation of one of said alphanumeric keys for generating a character code associated with said actuated alphanumeric key, wherein said code generating means respond to actuated position of said heavy print selecting member for generating a heavy print code associated with said character code, a line store having cells associated with said printing points for storing therein character codes and the associated heavy print code for moving the print unit along the printing line and in front of the printing points of the already written characters, means responsive to the printing point of the print unit for addressing in sequence an associated cell of said cells, and a deleting device for deleting from the sheet characters already written using reprinting in a deleting mode of the characters written, wherein said deleting device comprises means which identify the cell of the character written to be deleted and which recall from the line store the code of said characters written, means responsive to the character code of said characters to reprint them in a deleting mode and means responsive to the heavy print code associated with said code of character for repeating the reprint of said characters in the delete mode after the print unit has been displaced substantially said predetermined distance with respect to the first reprint in order to completely delete the character written through said heavy print mode.

4,500,217

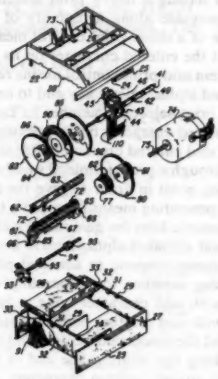
ELECTRONIC PRINTER MECHANISM WITH MOVABLE PRINTHEAD ASSEMBLY

Danny E. Swindler, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 12, 1982, Ser. No. 441,313
Int. Cl.³ B41J *19/30, 25/30, 29/02*
U.S. Cl. 400—320 **2 Claims**

1. A printer mechanism comprising:
a housing;

a rotatable operating shaft mounted in said housing;
a carrier member mounted on said operating shaft for traversing movement therealong;
a printhead fixedly supported by said carrier member for traversing movement therewith in relation to said operating shaft and adapted to selectively produce indicia including alphanumeric characters and symbols for printing onto a web medium disposed in opposed relation to said printhead;
a platen member disposed above said operating shaft and extending across said housing in parallel offset relation to said operating shaft, said platen member having a web-supporting planar surface facing said printhead;
means biasing said platen member in a direction toward said printhead such that the web medium extending between said printhead and said platen member is loosely clamped therebetween;
a motor having a rotatable power shaft;
gear train means operably associated with said power shaft and said operating shaft to impart rotation to said operating shaft upon the rotation of said power shaft, said gear train means comprising
a drive gear fixed to said power shaft and rotating therewith,
an idler reducer gear having a cogwheel of larger diameter with respect thereto and movable therewith loosely mounted on said power shaft,



a first driven gear fixedly mounted on said operating shaft,
a second driven gear of smaller diameter than said first driven gear, said second driven gear being fixedly mounted on said operating shaft and being movable with said first driven gear,
control gear means loosely mounted on said operating shaft, said control gear means comprising a toothed gear wheel having a plurality of teeth on its outer periphery of a number xN, where x is an integer multiple of the number of teeth N on the outer periphery of said reducer gear, said toothed gear wheel of said control gear means having a pattern of conductive timing strips disposed on one side surface thereof to define a timing control and having cam means disposed on the opposite side surface thereof,
said drive gear being in meshing engagement with said first driven gear to impart rotation thereto via the rotation of said power shaft for rotating said second driven gear and said operating shaft,
said second driven gear being in meshing engagement with said cogwheel of said idler reducer gear to impart rotation thereto when said second driven gear is undergoing rotation,
said reducer gear being in meshing engagement with said toothed gear wheel of said control gear means to impart rotation thereto when said reducer gear is undergoing rotation such that said control gear means is rotated at a speed 1/x of the rotary speed of said reducer gear,
timing control means including an electrical contact member in engagement with one of said conductive timing strips of said pattern thereof disposed on said one side surface of said toothed gear wheel for regulating the operating cycle of said printer mechanism in response to rotation of said control gear means disposing successive conductive timing strips in respective engagement with said electrical contact member in producing respective lines of printed type on the web medium, and
means operably associated with said cam means disposed on the opposite side surface of said toothed gear wheel of said control gear means for advancing the web medium one line at a time in response to completion of one line of printed type by said printhead; and
means actuating said motor to rotate said power shaft; and
said carrier member moving axially along said operating shaft in response to the rotation thereof to position said printhead for producing printed indicia along a line of the web medium disposed between said printhead and said platen member.

4,500,218

KEYBOARD KEY WITH EMBEDDED TOP CHARACTER

Yoshikazu Nishikawa, Misato, Japan, assignor to Toho-Polymer Kabushika Kaisha, Tokyo, Japan

Filed May 20, 1982, Ser. No. 380,414
Claims priority, application Japan, Jun. 5, 1981, 56-85565
Int. Cl.³ B41J *5/16*
U.S. Cl. 400—490 **3 Claims**

1. An operation indicating member which comprises a body made of a soft silicone-type elastomer, said body having a smooth, uninterrupted top surface, and a pre-printed indicia layer embedded in the top surface of said body and having a top surface extending flush with the top surface of said body as a continuation thereof, said pre-printed indicia layer comprising a printing ink consisting of a material having a vulcanizing mechanism similar to that of the silicone-type elastomer, said printing ink being embedded in the form of an indicia character in the soft silicone-type elastomer forming the top surface of said body and vulcanized together with said silicone-type elastomer to form a unitary structure therewith, said pre-printed indicia layer being initially formed by printing of said ink on a separate transfer plate and transferred to the top surface of said body without punching by virtue of the co-vulcanization of said ink and said body.

4,500,219

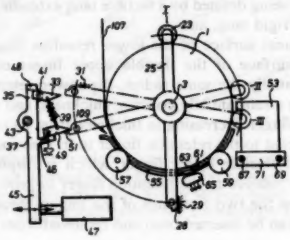
METHOD AND APPARATUS FOR GUIDING THE PAPER IN TYPEWRITERS OR SIMILAR OFFICE MACHINES

Heinz Lange; Albert Rix, and Dieter Drogi, all of Wilhelmshaven, Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Aug. 18, 1982, Ser. No. 409,050
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133297
Int. Cl.³ B41J *3/04, 11/44, 13/042*
U.S. Cl. 400—568 **15 Claims**

1. A paper guiding device for use in an office machine in which successive lines of characters are printed on a paper sheet with an ink which can be smeared for a short period after application to the sheet, and which machine includes a carriage supporting a printing head for movement along a printing line, said device comprising: a platen shaft arranged to be rotatably

mounted in the machine; a platen carried by said shaft and constituting a paper support; said platen shaft and platen being rotatable in a first direction for insertion and feeding of a paper sheet in the machine and in a second direction opposite to the first direction; a paper guide trough surrounding a portion of said platen; a paper holding rail disposed adjacent said platen; a plurality of pressure rollers carried by said rail; spring means disposed for urging said rollers toward said platen in order to press a paper sheet against said platen; a rocker member supporting said rail and mounted to undergo pivotal movement about the axis of rotation of said platen shaft between a paper insertion position and a normal printing position; and coupling means coupling said rocker member and platen such that: rotation of said platen in said second direction effects pivotal



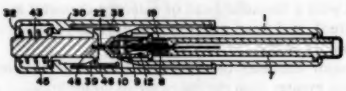
movement of said rocker member into said paper insertion position for insertion of the leading edge of a paper sheet between said rollers and said platen; rotation of said platen in said first direction during insertion and feeding of a paper sheet is accompanied by maintenance of said rocker member in said paper insertion position until the leading edge of such paper sheet is pressed between said rollers and said platen; and further rotation of said platen in said first direction effects pivotal movement of said rocker member into said normal printing position, with simultaneous transport of the paper sheet, while said rollers maintain the sheet flat against said platen, said normal printing position being sufficiently remote from the printing line to assure that the printed characters will not be smeared upon contact with said rollers.

4,500,220

MECHANICAL PENCIL WITH REMOVABLE LEAD FEED COVER

Junichi Hashimoto, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1982, Ser. No. 420,294
Int. Cl.³ B43K *21/02, 21/22, 9/00*
U.S. Cl. 401—53 **6 Claims**



1. A mechanical pencil having a removable cover and comprising:

an elongated tubular housing having first and second ends;

a sleeve longitudinally displaceably mounted in said housing and projecting from said first end thereof to form a pencil tip, said sleeve including an inner surface portion;

an elastomeric ring mounted in said sleeve for frictionally slideably holding a lead therein;

a lead feed tube longitudinally displaceably mounted within said housing, said feed tube including jaws for clamping the lead and a lead container projecting from said second end of said housing, said jaws being positioned within said sleeve;

first spring means for biasing said feed tube to a retracted position towards said second end of said housing;

an annular member mounted in said inner surface portion of said sleeve for longitudinally sliding movement to a position in close contact with said jaws for forcibly placing said jaws into a closed position to firmly grasp the lead therein;

a removable tubular cover capable of being attached to said tubular housing over either of said first or second ends thereof; and

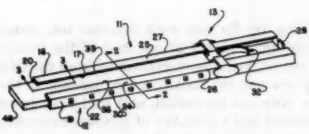
means for, upon mounting said cover over said first end of said housing, moving the lead to extend from said tip by retracting said sleeve inwardly of said housing against the force of said spring means for a first distance, during which said jaws are maintained in position clamping the lead and said sleeve moves relative to the lead and said feed tube, and for a second distance, during which said jaws are unclamped from the lead and said sleeve and the lead move relative to said feed tube, said moving means comprising a button member mounted within said cover coaxially therewith, said button member having a surface contacting said sleeve during retraction thereof, and said surface having therein a slot into which the free end of the lead is extended upon movement of said sleeve relative to the lead.

4,500,221

MARKER HOLDER APPARATUS

Clarence A. Emerson, 203 E. Birch, Bozeman, Mont. 59715

Filed Oct. 1, 1981, Ser. No. 307,617
Int. Cl.³ B43K *23/00, 21/06*
U.S. Cl. 401—82 **7 Claims**



1. Marker holder apparatus including a guide portion and an advancing portion; said guide portion including an elongated member with an open longitudinal slot, said elongated member including a bottom section, sidewall sections extending substantially perpendicularly from the longitudinal edges of said bottom section, flange sections extending from longitudinal edges of said sidewall sections remote from said bottom section, said flange sections extending toward one another substantially parallel to said bottom section, a stop section disposed adjacent one end of said elongated member, biasing means located adjacent the end of said elongated member remote from said stop section, a plurality of spaced openings along the length of each of said sidewall sections, the openings in one of said sidewall sections being spaced therealong at points corresponding to the openings in the other of said sidewall sections; said advancing portion including an arcuate strip section disposed within said elongated member with each free end thereof being disposed adjacent a sidewall section, said strip section having a width substantially the same as the height of said elongated member, connector sections extending from said strip section across said flange sections from the free edges to the outer edges thereof, actuator sections extending from said connector sections along said sidewall sections and spaced substantially parallel therefrom, opening-engaging sections extending from said arcuate strip section adjacent said connector sections, said opening-engaging sections extending from said strip section partway toward said actuator sections, said opening-engaging sections each including a projection of reduced width extending from said arcuate strip section, said arcuate strip section biasing said opening-engaging sections toward said sidewall sections; whereby applying finger pres-

sure to said actuator sections frees said opening-engaging sections from openings in said sidewall sections to allow said advancing portion to be moved along the length of said elongated member.

4,500,222

AQUEOUS INK WRITING TIP

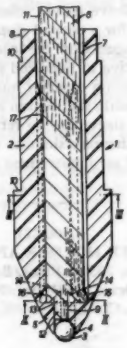
John P. Clading-Boel, Enfield, England, assignor to Waite & Son Limited, Mitcham, England

Filed Jul. 10, 1979, Ser. No. 56,230

Claims priority, application United Kingdom, Jul. 11, 1978, 29444/78; Sep. 11, 1978, 36371/78

Int. Cl.³ B43K *7/10, 8/02*

U.S. Cl. 401—209 **6 Claims**



1. A writing tip for use with aqueous ink comprising an elongate housing; a socket at one end of the housing; a ball retained in the socket; a bore extending from the other end of the housing towards the socket; a feed passage in the housing between the bore and the socket, said feed passage comprising a central channel and a plurality of grooves extending radially outwardly from the channel and between the bore and socket; and a feed core comprising fibrous material defining aqueous ink feeding capillaries extending into the housing at the other end thereof, through said bore and into the feed passage at the end thereof remote from the socket, which end of the feed passage is formed with a plurality of projections which extend into said bore and shear the material of the core as it is inserted into the feed passage to displace material not aligned with said passage into a region of the bore adjacent said end of the passage whereby the material of the core within the feed passage is substantially uncompressed.

4,500,223

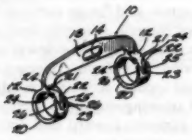
CARRIER FOR HINGED SUPPORT OF PAGES

Gerald T. Downing, Port Washington, and Karl P. Schaefer, Brookfield, both of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Sep. 14, 1983, Ser. No. 531,883

Int. Cl.³ B42F *3/02, 13/02*

U.S. Cl. 402—20 **6 Claims**



1. A carrier for holding a plurality of pages having ring-engaging apertures along an edge portion comprising, in combination:

(1) a support member;

(2) at least one ring extending from the support member and including

(a) a rigid lower retention finger extending about a major portion of the ring, and

(b) a flexible upper finger integral with the retention finger and extending about a minor portion of the ring;

(3) the lower retention finger and the flexible upper finger each having a free end located adjacent to and spaced from one another;

(4) the free end of the lower retention finger being defined by at least one rigid tang and the free end of the upper finger being defined by a flexible tang extending alongside of the rigid tang; and

(5) the inner surface of the lower retention finger and the inner surface of the flexible upper finger each having substantially the same radius, the lower retention finger having a substantially constant thickness, and the flexible upper finger decreasing in thickness from its root portion connected to the retention finger to its free end to form a tapered flexible upper finger which is displaceable inwardly relative to the retention finger to provide a space between the two free ends of the fingers through which pages can be inserted onto and removed from the ring.

4,500,224

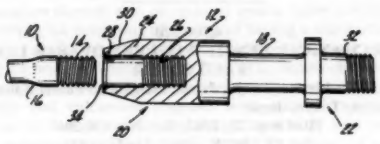
COUPLING FOR SUCKER ROD ASSEMBLY

Peter D. Ewing, Milford, Mich., assignor to NSS, Industries, Inc., Plymouth, Mich.

Filed Jul. 22, 1983, Ser. No. 516,453

Int. Cl.³ F16B *7/18*

U.S. Cl. 403—343 **4 Claims**



1. A sucker rod assembly comprising:

a rod with a threaded head of enlarged diameter at one end thereof, said head and rod being unitary with a tapered shoulder at the juncture thereof,

the major diameter of the threads on said threaded head being greater than the diameter of an unthreaded portion of the head,

a rod-end fitting comprising a unitary body including a tool receiving shank, a first connector portion at one end of said shank and a second connector portion at the other end of said shank,

said first connector portion comprising a socket having a threaded portion adjacent the bottom of said socket and an unthreaded flange adjacent the outer end of said socket,

said threaded head being threadedly engaged with the threaded portion of said socket,

said unthreaded flange of said socket being disposed in surface engagement with said tapered shoulder,

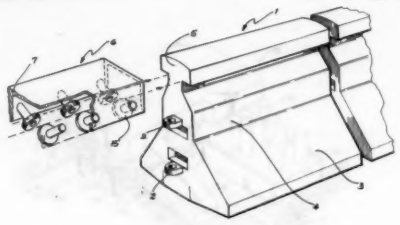
whereby said rod and rod-end fitting are mechanically interlocked in close fitting surface engagement.

4,500,225

TRANSFERABLE ROADWAY LANE DIVIDER

John P. Quittner, Castle Cove, Australia, assignor to Quicksteel Engineering Pty. Ltd., Botany, Australia

Continuation-in-part of Ser. No. 344,755, Feb., 1982,. This application Apr. 18, 1983, Ser. No. 485,622
Int. Cl.³ E01F *13/00*
U.S. Cl. 404—6 13 Claims



1. A transferable roadway lane divider comprising

at least one upstanding divider section having a base and a T-shaped upper end, said divider section being sufficiently high to form a crash barrier for automobiles and the like, and

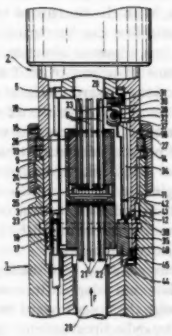
transfer means formed in unobstructed relationship on lateral sides and longitudinally throughout the entire length of the T-shaped upper end of said divider section for receiving and engaging a transfer apparatus to enable said divider section to be lifted and suspended for transfer on a roadway.

4,500,226

COUPLING DEVICE, AN ELECTRIC MOTOR FITTED WITH SAID DEVICE AND A METHOD OF COUPLING TWO ELECTRIC MOTORS TOGETHER

Jacques Romand-Monnier, Delle, and Jean-Pierre Lejeune, Beaucourt, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed Apr. 8, 1983, Ser. No. 483,305
Claims priority, application France, Apr. 15, 1982, 82 06487
Int. Cl.³ F16D *1/00*
U.S. Cl. 403—13 6 Claims



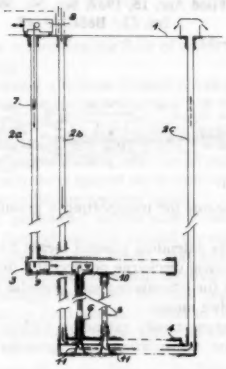
1. A device for coupling first and second units, each of which has a stationary body and a coaxial rotating shaft, wherein; the end of the body of the second unit has an outer male cylindrical coupling bearing portion shoulder, the end of the body of the first unit having a corresponding female coupling bore receiving said male cylindrical coupling bearing portion; the shaft end of each unit is splined and is axially recessed relative to the end of the unit body; each unit further having an automatic shaft relative positioning and blocking means for its shaft relative to its body at the time of coupling, means for releasing said automatic shaft relative positioning and blocking means allowing the rotating shafts to be released at the end of the coupling process and means for relative angular positioning of the bodies of the two units, a shaft coupling sleeve with splined inside surfaces for coupling said shafts and a body coupling sleeve rotatably mounted on the body of the second unit and screwed onto the body of the first unit, a first stop on the body of said second unit engageable with said first unit body for terminating axial movement of said first unit relative to said second unit, a second stop on the body of said second unit engageable with said body coupling sleeve for terminating movement of said body coupling sleeve thereby making said bodies fast in the coupled postion.

4,500,227

PROCESS AND GEOLOGICAL INSTALLATION FOR THE REMOVAL OF RADIOACTIVE WASTE

Guy Courtois, Paris, and Claude Jaquen, Guyancourt, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 4, 1983, Ser. No. 491,395
Claims priority, application France, May 5, 1982, 82 07786
Int. Cl.³ E21F *17/16;* G21F *9/24*
U.S. Cl. 405—128 12 Claims



1. A geological installation for storing radioactive waste, said installation comprising;

a storage site located at a predetermined depth below ground level;

a plurality of vertical access shafts extending between the surface of the ground and the storage site for providing access for the waste and for ventilation purposes;

a first upper plurality of tunnels all lying in a first horizontal plane substantially equidistant from each other and parallel to a first reference line representative of the common direction of said first plurality of tunnels, the first reference line lying in the first horizontal plane and also lying in a first vertical plane;

means within said first plurality of tunnels for moving the waste;

a second lower plurality of tunnels all lying in a second horizontal plane substantially equidistant from each other and parallel to a second reference line representative of the common direction of said second plurality of tunnels, the second reference line lying in the second horizontal plane and also lying in a second vertical plane;

the first vertical plane of the first reference line representative of the common direction of said first plurality of tunnels intersecting the second vertical plane of the sec-

ond reference line representative of the common direction of said second plurality of tunnels at an angle α;

a plurality of vertical storage shafts for storing the waste and linking, in accordance with a regular geometric grid, the tunnels of the first plurality and the tunnels of the second plurality, the upper part of each storage shaft communicating with a tunnel of the first plurality and the lower part of each storage shaft communicating with a lateral recess connected to one of the tunnels of the second plurality; and

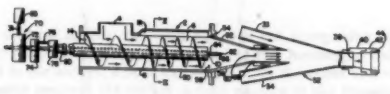
at least one of said vertical access shafts supplying the tunnels of the second plurality with fresh air from the ground surface, and at least one other of said vertical access shafts evacuating hot air from the tunnels of the second plurality to the ground surface, the cooling air circulation taking place in hairpin-like manner in an upward-downward path in the vertical storage shafts connecting the two pluralities of tunnels during interim storage by the convective effect of heat released by the stored waste.

4,500,228

GRANULAR MATERIAL PNEUMATIC TRANSPORT APPARATUS

Robert C. McDonald, Waterloo, and Derek L. Macartney, Kitchener, both of Canada, assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Apr. 15, 1982, Ser. No. 368,559
Int. Cl.³ B65G 53/48
U.S. Cl. 406—61 **12 Claims**



1. An apparatus for transporting a granular material comprising:

a first axially extending conduit means having a narrowing frustroconical discharge portion at a first end thereof:

inlet means for introducing said granular material into said first conduit means;

an auger means axially extending within said first conduit means for transporting said granular material therethrough;

a first compressible fluid conduit means axially extending through said auger means the inlet to said fluid conduit means extending axially outwardly of a second end of said first conduit means;

a nozzle associated with the discharge end of said first fluid conduit means and located within said frustroconical discharge portion for delivering to said granular material a compressible fluid at a low volume and high pressure from a first source, said first compressible fluid capable of disaggregating said granular material;

second conduit means having an inlet directly connected to said narrow end of said frustroconical discharge portion of said first conduit means for receiving said granular material therefrom;

a second conduit compressible fluid supply means substantially adjacent to the inlet of said second conduit means for delivering to said second conduit means a compressible fluid at a high volume and a low pressure from a second source, said compressible fluid capable of propelling said disaggregated granular material out of said second conduit means; and

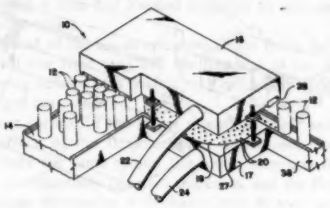
motor means located outwardly of said second end of said first fluid conduit means for axially pushing or pulling said nozzle intermediate said frustroconical discharge portion of said first conduit in response to remote commands.

4,500,229

METHOD AND APPARATUS FOR FORMING CYLINDRICAL ARTICLES INTO A SINGLE LINE

Rodger E. Cole, Golden, and Richard H. Vander Meer, Arvada, both of Colo., assignors to Goldco Engineering, Inc., Golden, Colo.

Filed Apr. 8, 1982, Ser. No. 366,749
Int. Cl.³ B65G 51/02
U.S. Cl. 406—88 **10 Claims**



1. Apparatus for forming mass conveyed similar cylindrical articles into a single file row, the apparatus comprising:

delivery means for conveying a plurality of cylindrical articles across the width thereof;

a pair of substantially horizontal plates spaced apart a distance greater than the height of the articles but less than the diagonal dimension thereof;

first barrier means positioned between said plates with said first barrier means having an arcuate central portion that extends between opposite first and second end portions, said first end portion of said first barrier means being adjacent to said delivery means and said arcuate central portion being positioned in the path of cylindrical articles received from said delivery means so that said cylindrical articles received at said arcuate central portion of said first barrier means are thereafter directed by said arcuate central portion in an arcuate path between said plates toward said second end portion of said first barrier means;

a plurality of angled holes defined through each of said plates with each hole being individually oriented relative to vertical at an angle less than normal to the plate and with a predetermined component in the horizontal direction of the plate, with the horizontal components of said holes adjacent said first barrier means being substantially parallel thereto in a common direction and with the horizontal components of others of said angled holes being oriented in directions toward different parts of said arcuate central portion of said first barrier means;

single file barrier means located parallel to and spaced from said second end portion of said first barrier means a distance which will admit one cylindrical article therebetween, said single file barrier means extending along a segment of said second end portion of said first barrier means in the common direction of the horizontal components of said adjacent holes; and

air flow means communicating with the angled holes defined through each plate and adapted to conduct a pneumatic flow to and through the holes toward the volume between the plates whereby cylindircal articles conveyed from said delivery means between the plates will be urged toward said arcuate central portion of said first barrier means by pneumatic flow through said others of said angled holes and along said first barrier means by pneumatic flow through said angled holes adjacent to said first barrier means so that cylindrical articles are thereby passed in a single file between said second end portion of said first barrier means and said single file barrier means and thereafter discharged in single file therebetween.

4,500,230

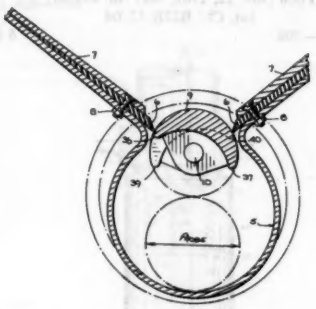
PNEUMATIC GATE FOR RAILWAY HOPPER CARS

Norman E. Bateson, Culver, Ind., assignor to Norson Industries, Inc., Culver, Ind.

Continuation of Ser. No. 393,826, Jun. 30, 1982, abandoned, which is a continuation of Ser. No. 80,277, Oct. 1, 1979, abandoned. This application Jul. 28, 1983, Ser. No. 517,919

Int. Cl.³ B65G *53/46*

U.S. Cl. 406—131 11 Claims



8. A hopper discharge structure having a discharging valve for evacuating granular-like lading from hopper cars and the like comprising:

(a) a hopper structure providing end walls and inclined side walls, the confronting lower edges of which are spaced apart to provide a discharge opening therebetween;

(b) a cylindrical valve rotatably supported between said end walls along a line parallel to said discharge opening formed between said inclined side walls;

(c) said valve shaft having its axis of rotation located equally between and along a line beneath said confronting lower edges of said inclined side walls, and

(d) an arcuate member having a periphery of less than 360° fixed to said shaft for rotation therewith, said arcuate member having an arcuate outer surface extending circumferentially of said axis of rotation and of a size such that in at least one of its rotated positions no portion of its periphery intersects said lower edges of the hopper, so that said aperture is fully open, and in another of its rotated positions, two portions of its periphery intersect said lower edges so that said aperture is closed and said arcuate member having an inner surface which is non-parallel to said outer surface thereof and extending from one peripheral edge of said outer surface to the other peripheral edge of said outer surface, said inner surface being substantially co-extensive with said outer surface for substantially the axial length of said outer surface and being spaced from said outer surface substantially throughout its length between said one peripheral edge and said other peripheral edge by an amount greater than the spacing between said inner surface and said outer surface at said peripheral edges thereby to provide a rigid arcuate member capable of withstanding the load of the lading; and

(e) means for rotating said shaft within said discharge opening so as to selectively position said arcuate member into positions thereof.

4,500,231

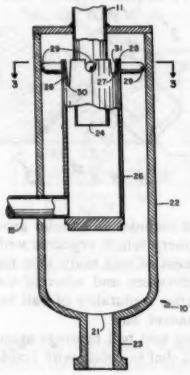
VALVE FOR CONTROLLING SOLIDS FLOW

M. Daniel Staiger, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 426,446

Int. Cl.³ B65G *53/40*

U.S. Cl. 406—198 5 Claims



1. A valve for controlling the flow of solids into a transport means comprising:

a container having a bottom located opening for receiving said transport means and having a top located opening therethrough;

a vessel for receiving solids positioned within said container and having a top overflow, said vessel including a plurality of V-notch weirs spaced about said top overflow, said V-notch weirs having unequal depth;

an inlet line, positioned within said vessel and sealingly positioned through said top located opening, for discharging the solids into said vessel, said inlet line having a discharge point lower than said top overflow;

a fluid line sealingly connected into said vessel for introducing a fluidizing fluid into said vessel to fluidize the solids therein sufficiently to cause solids to overflow said top overflow;

means for controlling the flow of fluidizing fluid through said fluid line such that the flow of solids is controlled at a rate determined by the flow of said fluidizing fluids.

4,500,232

BORING BAR

Mark K. Jacobson, and Stanley C. Belttari, both of West Bloomfield, Mich., assignors to Boremaster Precision Tool & Mfg., Windsor, Canada

Filed Mar. 17, 1982, Ser. No. 359,158

Int. Cl.³ B23B *29/02*

U.S. Cl. 408—153 8 Claims

1. A boring bar comprising:

a body having a transverse throughbore at one end, said throughbore having a first end and a second end,

a slide member axially slidably positioned within said throughbore,

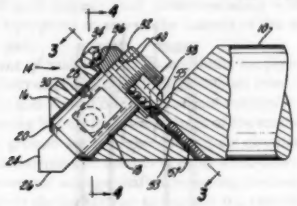
means for locking a cutting tool having at least one cutting edge to said slide member so that said at least one cutting edge extends outwardly from one end of said slide member at said first end of said throughbore,

said body having a cylindrical recess formed concentrically around said second end of said throughbore,

means for axially adjustably positioning said slide member in said body throughbore,

wherein said slide member includes an externally threaded

portion at the other end of said slide member and wherein said axial adjustment means further comprises an internally threaded annular dial positioned within said cylindrical recess which threadably engages the slide member threaded portion, and means for locking said dial to said body against axial movement,



wherein said dial includes an annular groove formed about its outer periphery which registers with a groove in the cylindrical recess of said body thus forming an annular channel therebetween and wherein said locking means further comprises a plurality of ball bearings positioned within said channel, and

means for locking said ball bearings against rotation while permitting said dial to rotate with respect to said body.

4,500,233

ROTARY MATERIAL REMOVING TOOL

Dieter Dehn, Frankfurt am Main, Fed. Rep. of Germany, assignor to Stellram GmbH, Heusenstramm, Fed. Rep. of Germany

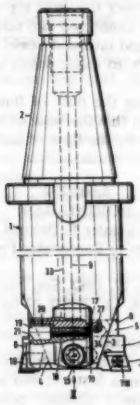
Filed Jul. 16, 1982, Ser. No. 398,796

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204923

The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.

Int. Cl.³ B23B *29/03*

U.S. Cl. 408—182 **25 Claims**



1. A material removing tool, comprising a rotary support including a first portion arranged to receive torque from a prime mover, a second portion having an end face, a transversely extending recess in said end face, a bottom surface in said recess, and a pair of legs flanking said recess; a carrier disposed in said recess, abutting said bottom surface and having a front end face facing away from said bottom surface and provided with an elongated guide groove extending transversely of the axis of said support; a pair of abutting knife holders in said guide groove; means for shifting said holders relative to said carrier and lengthwise of said guide groove, said shifting means comprising discrete screws having heads and shanks meshing with said carrier and extending in parallelism with said groove, said carrier and said holders defining chambers for the heads of the respective screws; and clamping means for biasing said legs against said carrier.

4,500,234

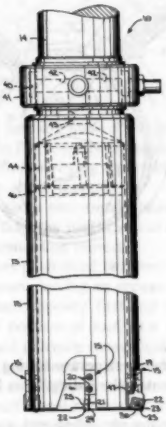
TREPANNING TOOL

Eugene C. Orth, Delafield, and Sebastian Ebenhoch, Menomonee Falls, both of Wis., assignors to Waukesha Cutting Tools, Inc., Waukesha, Wis.

Filed Nov. 12, 1982, Ser. No. 441,287

Int. Cl.³ B23B *51/04*

U.S. Cl. 408—206 **6 Claims**



1. In a trepanning tool for producing a through hole in a metal workpiece by cutting an annular groove about a removable core; a hollow, cylindrical body open at its leading end and closed at its trailing end; an axially disposed and extending shank provided at the trailing end of the body for mounting the tool in a machine for actual or effective rotation relative to the workpiece; four carbide cutting inserts having a cutting face defining a plurality of cutting edges at the periphery thereof and mounted at the leading end of the body; said inserts being circumferentially and equidistantly spaced with their cutting faces facing in the direction of actual or effective tool rotation; said inserts being varyingly spaced relative to the axis of the tool and comprising an outermost insert, a next outermost insert, an innermost insert, and a next innermost insert; said outermost insert being disposed to establish the outside diameter of the annular groove and having an active cutting edge extending generally inwardly toward the tool axis; said innermost insert being disposed to establish the inside diameter of the annular groove and having an active cutting edge extending generally outwardly relative to the tool axis; said next outermost insert being angularly oriented relative to the outermost insert to provide that its active cutting edge will cut a segment of the annular groove that intersects with the active cutting edge of the outermost insert so that the active cutting edge of the outermost insert will cut a pair of spaced segments of the annular groove; said next innermost insert being angularly oriented relative to the innermost insert to provide that its active cutting edge will cut a segment of the annular groove that intersects with the active cutting edge of the innermost insert so that the active cutting edge of the innermost insert will cut a pair of spaced segments of the annular groove; said four cutting inserts being thus adapted to sever the radial span of the annular groove into six relatively small segments that

can readily be evacuated from the cutting region and annular groove as chips.

4,500,235

COUPLING

Anders E. Johnsen, Karlsgårdsgatan 7B, S-781 33 Borlänge, Sweden

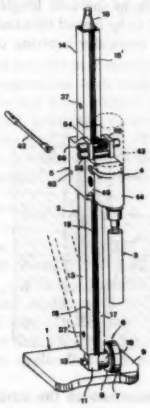
PCT No. PCT/SE81/00249, § 371 Date May 4, 1982, § 102(e) Date May 4, 1982, PCT Pub. No. WO82/00863, PCT Pub. Date Mar. 18, 1982

PCT Filed Sep. 4, 1981, Ser. No. 380,666

Claims priority, application Sweden, Sep. 5, 1980, 8006209

Int. Cl.³ B23B *39/00*

U.S. Cl. 408—238 **6 Claims**



1. A coupling for connecting at least two tubular members to each other, a first of said tubular members having a recess and a second of said tubular members having a projection, said recess having an interior conical surface and said projection having an exterior conical surface, tightening means for moving said conical surfaces into wedging contact with each other, said tightening means being operable to cause a generally axial relative movement of said tubular members so as to tend to urge said projection on said second tubular member into said recess of said first tubular member, said projection on said second tubular member including two elements axially movable relative to each other, said elements including a first element including said conical surface of said second member and a second element engageable by said tightening means, spring means acting between said elements and being operable to accumulate spring force upon axial displacement of said second element relative to said first element by said tightening means in order to tighten said coupling, said second element having a portion located at the outer end of said projection so as to form an extension on that part of the first element which has the smallest diameter, an axial hole in said first element, a rod passing through said axial hole and having a threaded end provided with a nut, said portion being attached to said rod, said spring means being located between said nut and a surface on said first element facing away from the outer end of said projection, said first element having an outer end with a shoulder, said spring means acting on said nut so as to urge said second element in a direction towards said shoulder, said recess in said first tubular member having an inner recess portion confined by a wall for receiving said second element, said wall and said second element having transversally extending openings locatable in register with each other upon assembly of said tubular members to receive said tightening means, said tightening means including an eccentric, said rod transmitting, when the coupling is assembled, generally all longitudinally directed forces tending to separate the members from each other.

4,500,236

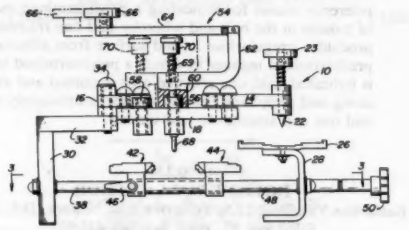
ENGRAVING APPARATUS

Victor Plotkin, Brooklyn, N.Y., assignor to New Hermes Incorporated, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,610

Int. Cl.³ B23C *1/16*

U.S. Cl. 409—86 **8 Claims**



1. Engraving apparatus comprising a frame, a pantograph supported by the frame, the pantograph supporting a stylus for tracing indicia to be engraved, a spindle assembly including a spindle for engraving indicia, two discrete links of said pantograph each having means thereon for mounting the spindle assembly at locations which change the magnification of the indicia to be engraved, said assembly being manually movable from one mounting means to the other mounting means, said assembly including a pivotable lever arranged to move the spindle downwardly while the spindle is in each of the locations identified by said mounting means, each mounting means including an upstanding boss, said spindle assembly including a portion which is telescoped with respect to one of said bosses, said mounting means being located on parallel links of the pantograph and wherein said parallel links are each pivotably connected at one end to a link supporting the stylus, means for enabling said spindle assembly to be pivotable through an arc approximately 180° with respect to its mounting boss so as to facilitate application of left-hand or right-hand pressure to the engraving tool, and a work holder capable of holding work to be engraved adjacent each said mounting means.

4,500,237

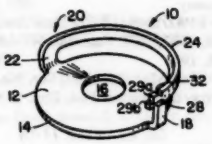
TENSION INDICATING WASHER FOR SMOOTH AND IRREGULAR SURFACES

Frank V. Pliml, Jr., Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 4, 1983, Ser. No. 520,286

Int. Cl.³ F16B *31/02*

U.S. Cl. 411—11 **2 Claims**



1. A tension indicating washer for use with a smooth as well as an irregular support surface for indicating the tension in a bolt and comprising:

a frustoconical washer having a centrally disposed aperture for receiving a bolt therethrough and a peripheral bearing

surface for engaging said support surface, said peripheral bearing surface including one relieved area; and

means for indicating, said means including a radially and axially disposed reference means, and circumferentially disposed arm means, said arm means supported in axially spaced relation from said washer by attachment of one end of said arm means proximate to the outer periphery of said washer with the free end of the arm means spaced from the reference means in a predetermined manner;

whereby as force is applied to the washer by increased tension in the bolt the washer deflects towards a planar condition causing the arm means to move in a predetermined manner to a predetermined position relative to said reference means for indicating a predetermined measure of tension in the bolt and whereby said one relieved area precludes irregularities in said surface from affecting the predetermined manner in which a predetermined tension is indicated, said one relieved area is coined and extends along said peripheral bearing surface continuously where said one end attaches to said washer.

4,500,238

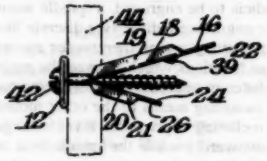
HOLLOW WALL ANCHOR

Eustathios Vassiliou, 12 S. Townview Ln., Newark, Del. 19711

Filed Sep. 27, 1982, Ser. No. 425,057

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—30 **11 Claims**



1. A fastening member for a hollow wall comprising a thin sheet-metal anchor having a substantially flat head portion and a hole therethrough, said hole having an axis perpendicular to the head, a substantially flat neck in a plane perpendicular to the head containing the axis, said neck having an elongated opening therethrough the opening extending in the plane of the neck the full length of the neck along the axis and, first and second, thin, flat sheet metal spreadable anchoring blades extending from said neck in the direction of the axis, said blades being coplanar with said neck, each of said blades having an inner and an outer surface, the inner surface of the first blade in close contact with the inner surface of the second blade, at least one of said blades terminating in a point, and a generally elongated fastener having a diameter commensurate with the hole in said head whereby insertion of the fastener in the hole and through the neck spreads the blades angularly.

4,500,239

INTERLOCKING TOGGLE BOLT

Heinrich Liebig, Wormser Strasse 23, D-6102 Pfungstadt, Fed. Rep. of Germany

PCT No. PCT/EP82/00061, § 371 Date Aug. 25, 1982, § 102(e) Date Aug. 25, 1982, PCT Pub. No. WO82/03664, PCT Pub. Date Oct. 28, 1982

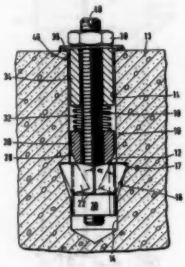
PCT Filed Mar. 23, 1982, Ser. No. 414,369

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1981, 3115040

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—65 **3 Claims**

1. A toggle bolt to be set interlockingly in a bore provided with a radially circumferential undercut surface; said toggle bolt comprising a toggle body having a diameter corresponding substantially to the diameter of the bore and adapted to be inserted into the bore, an elongated mounting bolt having a bore internal end and an outer end, said body being in the form of an end piece of relatively short length disposed on the bore-internal end of said elongated mounting bolt; said mounting bolt having on said outer end a screw head or threaded-on nut, locking elements having internal ends seated on said mounting bolt and closed together to form a thick-walled cylindrical barrel around said mounting bolt, said locking elements also having ends which point toward the bore mouth and which are swingable from a position lying within the diameter of the bore to a position in which said ends project at least partially beyond the diameter of the toggle body and lockingly hook the undercut surface of the bore, a component having a conical section tapering toward the bore interior and engaging between the locking element ends pointing toward the bore mouth, said component upon a displacement of the end piece in the direction of the bore mouth positively turning the rearward ends of the locking elements outwardly, at least one sleeve displaceable in the bolt length direction and one helical spring adapted to be biased by axial compression being disposed between the conically tapering component disposed



for longitudinal displacement on the mounting bolt and the screw head or nut, an annular clasping element for fixing the bias of the spring being disposed on the ends of the locking elements which point toward the bore mouth, and having an annular section projecting on the bore mouth side beyond the diametric dimension of the corresponding bore, the clasping element being a plastic sleeve having a planar circumferential annular flange projecting integrally from the bore-mouth side end of said sleeve radially outwardly beyond the diametric dimension of the bore and also having at least one relatively thin, bendable tab projecting integrally from a bore-mouth side end edge of said plastic sleeve radially inwardly in the same plane as said annular flange and located on the bore-mouth side in front of at least one locking element respectively and, at the time of introduction of the toggle bolt into the bore, resting on the conical section of said tapering component, to thereby prevent displacement of said clasping element from said locking elements by engagement of said at least one tab on said conical section.

4,500,240

BOLT FASTENER

Thomas M. Moran, Cleveland, and Benedict J. DiBello, Strongsville, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

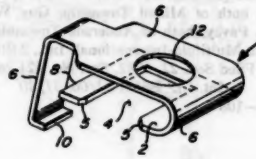
Filed Apr. 26, 1983, Ser. No. 488,832

Int. Cl.³ F16B *37/04*

U.S. Cl. 411—103 **4 Claims**

1. A fastener for securing a bolt to a frame through an aperture therethrough, said bolt having adjacent head and elongate shank portions, said fastener having a base member having a slot therethrough extending from an edge thereof that is dimensionally adapted to receive the bolt shank portion, a resilient arm extending upwardly away from an edge of the base member and thence in spaced-apart overhanging relationship across the side of the base member facing away from the frame

to which the bolt is to be secured to an opposite edge thereof and thence downwardly past the base member opposite edge and thence inwardly to a free-end thereof disposed on the side of the base member facing towards the frame to which the bolt is to be secured to provide an open-ended clip adapted to clip the fastener to an edge of the frame, said arm and base member spaced-apart for a distance sufficient to insure that the bolt head portion is received therebetween when the bolt shank



portion is received into the base member slot, and said fastener, bolt and frame cooperating with each other such that the arm is able to press the bolt head portion against the base member when the bolt shank portion is received into the slot and the arm is able to be snapped about the edge of the frame to secure the fastener thereto when the bolt shank member is received into the frame aperture with the base member laid against the frame.

4,500,241

MACHINE FOR MAKING RULED PADS OR THE LIKE

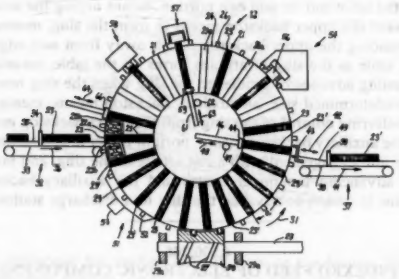
Hartmut Peters, and Bernd Ramcke, both of Hamburg, Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Sep. 15, 1982, Ser. No. 418,211

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1982, 3202706

Int. Cl.³ B42C *9/00, 19/00;* **B65C** *9/06;* **B65G** *29/00*

U.S. Cl. 412—37 **25 Claims**



1. A machine for converting stacks of overlapping sheets into pads wherein the sheets are held together by an adhesive which is applied to one edge face of each stack, comprising an indexible conveyor including a predetermined number of equidistant stack receiving means having inlets and arranged to orbit in a predetermined direction along a predetermined path; indexing means operable to rotate said conveyor by equal steps each of which is a whole multiple of the distance between the centers of the inlets of two neighboring receiving means; stack feeding means having means for advancing stacks of sheets in a given direction toward a first portion of said path and into empty receiving means of said conveyor while said indexing means is idle between successive operations thereof; treating means adjacent to said path and arranged to convert stacks in said receiving means into pads whose sheets are held together by an adhesive; and pad removing means having means for advancing pads from filled receiving means of said conveyor in a second portion of said path and in a direction at least substantially corresponding to said given direction, the distance between said first and second portions of said path, as considered in said predetermined direction, not being a whole multiple of one of said steps and the total number of said receiving means being divisible with a rest by the number representing said whole multiple of distances covered by one of said steps.

4,500,242

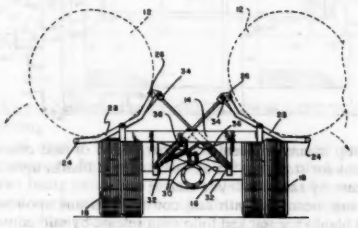
APPARATUS AND METHOD OF HANDLING BALES

Douglas L. Beikman, R.R. #2 Box 24, Linn, Kans. 66953

Filed Mar. 9, 1983, Ser. No. 455,106

Int. Cl.³ A01D *87/12;* **B60P** *1/16*

U.S. Cl. 414—24.5 **1 Claim**



1. An apparatus for handling bales comprising a frame;
an axle secured to said frame;
a pair of wheels rotatably attached to said axle for supporting said frame;
a pair of generally arcuate shaped basket means pivotally mounted on said frame for holding bales;
and hydraulic means attached to said frame for receiving power take off from a tractor, or the like, to pivot the basket means along the longitudinal axis thereof for dumping the bales onto the ground, each of said pair of basket means comprises an outside support rail, an inside support rail, and a plurality of arcuate shaped ribs interconnected to said rails, said hydraulic means engages each of said pair of basket means on the inside rail thereof, said hydraulic means comprises a pair of hydraulic cylinders connected to said frame in proximity to the axle and crosswise disposed with respect to each other;
a pair of hydraulic hoses extending from the tractor, or the like, to said pair of hydraulic cylinders; and
a rectangular tube attached to said frame, said hydraulic hoses being disposed within said tube while extending from the tractor, or the like, to said pair of hydraulic cylinders.

4,500,243

BLANK STACKING APPARATUS

Henry D. Ward, Jr., Cockeysville, and John B. West, Glyndon, both of Md., assignors to The Ward Machinery Company, Cockeysville, Md.

Filed Mar. 7, 1983, Ser. No. 472,855

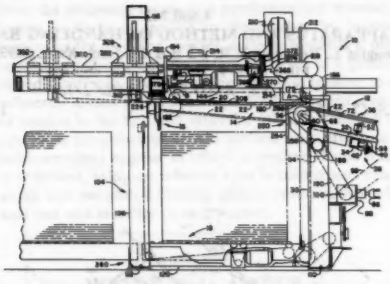
Int. Cl.³ B65G *57/04;* **B65H** *31/32*

U.S. Cl. 414—50 **24 Claims**

1. Apparatus for stacking blanks comprising in combination:
timed conveyor means for serially advancing and releasing said blanks from beneath a lower run of said conveyor means,
said timed conveyor means including a plurality of laterally spaced conveyor belt means having a circumference substantially equal to twice the maximum length of said blanks that can be processed by said apparatus and having at least two arrays of vacuum ports therein spaced substantially equidistant around said circumference and adapted for engagement with leading edges of said blanks

for causing said blanks to adhere to said belt means during advancement thereof,

said conveyor belt means further including a standoff portion extending substantially between said arrays of vacuum ports for preventing the portion of said blanks not adhering to said arrays from adhering to said conveyor belt means;



backstop means adjacent a discharge end of said conveyor means for stopping the advance of said blanks upon their release by said conveyor means; and

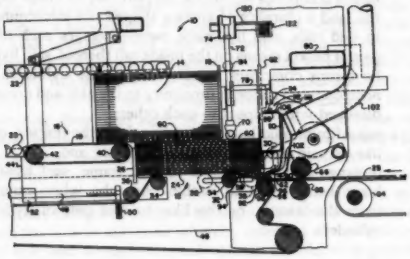
receiving means beneath said conveyor means upon which said blanks are stacked following release by said conveyor means.

4,500,244

AIR LIFT FOR BLANK STACKERS

Louis M. Sardella, Towson, and William F. Ward, Sr., Hampstead, both of Md., assignors to The Ward Machinery Company, Cockeysville, Md.

Filed Dec. 20, 1982, Ser. No. 450,994
Int. Cl.³ B65G *57/30*
U.S. Cl. 414—92 **4 Claims**



1. Apparatus for directing a flow of air between the bottom blank of a stack of substantially rigid and folded blanks and a similar blank advancing beneath said stack comprising:

air supply means adjacent a trailing edge of said bottom blank in a position to direct said flow of air beneath said bottom blank and above said advancing blank to form a cushion of air therebetween for reducing friction between said bottom blank and said advancing blank during advancement of said advancing blank to substantially completely beneath said stack and to press said advancing blank against an advancing means used to advance said advancing blank beneath said stack,

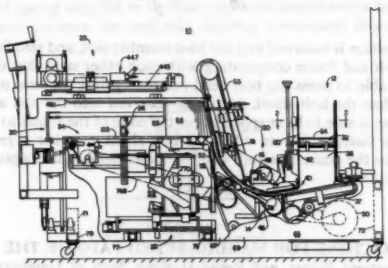
said air supply means including nozzle means inclined from horizontal no less than about 30° and no more than about 50° with a discharge end thereof being about one-half inch from a trailing edge of said bottom blank and about even with a bottom surface thereof and having an opening of about one-sixteenth to about one-quarter inch extending from about one-third to about the full width of said advancing blank for supplying air in a thin stream against said advancing blank at an exit elocity of no less than about 500 feet per minute and no more than about 8000 feed per minute.

4,500,245

MACHINE FOR ACCUMULATING EDGEWISE SUPPORTED ARTICLES

James A. Madewell, Terrace Park; Edwin A. Molitor; Norman P. Crowe, both of Miami Township; Guy W. Lampe, and Charles F. Pavey, both of Anderson Township, all of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Filed Sep. 22, 1982, Ser. No. 421,267
Int. Cl.³ B65H *31/06, 31/30*
U.S. Cl. 414—108 **6 Claims**



1. A machine for forming a slug of edgewise supported flat articles which comprises a table, paired conveyor belt means advancing the articles in shingle fashion past an edge of the table, one of the belt means having a portion parallel to and at substantially the level of the table for rapidly advancing lower edges of the articles away from the other of the belt means and onto the table, an upper backstop means supporting the articles on the table and on said belt portion, means urging the articles toward the upper backstop means to form the slug, means for advancing the upper backstop means away from said edge of the table as the slug of articles forms on the table, means for arresting advance of articles to the slug when the slug reaches a predetermined size, an auxiliary backstop means, means for transferring control of the slug from the upper backstop means to the auxiliary backstop means, upright finger means advanceable into engagement with a last article in the slug, and means for advancing the finger means and the auxiliary backstop means in unison to advance the slug to a discharge station.

4,500,246

INDEXED FEED OF ELECTRONIC COMPONENT SUPPLY TUBES

Stanley W. Janisiewicz, Endwell; Maynard J. Hills, Owego, and Edward J. Lovell, Binghamton, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Mar. 1, 1983, Ser. No. 471,056
Int. Cl.³ H05K *3/30*
U.S. Cl. 414—414 **9 Claims**

4. An automated apparatus for supplying electronic components to a processing station, said apparatus comprising:

cartridge means for supporting plural, generally inline and generally vertical columns of said components;

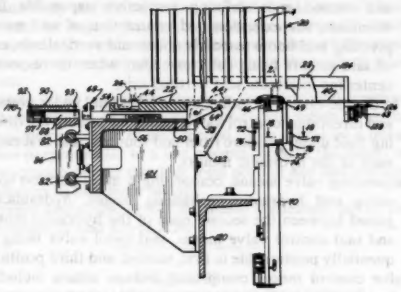
plural cartridge means stations and unload stations and reservoir means respectively arranged side-by-side;

indexing and locating means for indexing said columns generally horizontally and locating each of said columns sequentially at a column unload station, said column located at said unload station being an unload column;

said indexing and locating means comprising carriage means transferable between each of said catridge means stations

for selective indexing of said columns, according to said controller means;

reservoir means for receiving components from said unload column and providing a reservoir of a sufficient number of



said components for said processing station such that a continuous processing of said components at said processing station is attainable during a replacement of said columns; and

controller means for controlling said indexing.

4,500,247

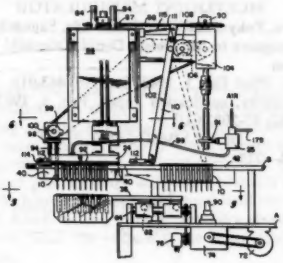
SYRINGE INSPECTION APPARATUS

Hugh P. McKnight, Indianapolis; Kenneth B. Welty, and Harold B. Dinius, both of Mooresville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 373,979, May 3, 1982, Pat. No. 4,456,115. This application Feb. 17, 1984, Ser. No. 581,423

Int. Cl.³ B65B *21/02*

U.S. Cl. 414—416 **9 Claims**



1. Apparatus for loading onto processing mechanism filled hypodermic syringes or the like having a needle end and an opposite open end provided with a finger flange, comprising

a movable loading table adapted to receive a syringe carrier containing a plurality of rows of syringes, each row containing a plurality of syringes,

means to move said table stepwise to position said rows successively in a loading position,

a feed conveyor having a pair of spaced longitudinal conveyor elements adapted to receive syringe bodies between them and to engage beneath the finger flanges of the syringes to support them in depending positions for longitudinal movement along the conveyor,

a gang chuck having means for clutching a plurality of syringes in a row and means to move the same in synchronism with said table moving means to clutch a row of syringes at said loading position, to carry the syringes therefrom to the conveyor, and to release the same onto the conveyor.

4,500,248

TRUCK WITH EXCHANGEABLE LOAD CARRIER

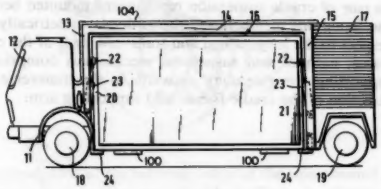
Thomas Kramer, Krefeld, Fed. Rep. of Germany, assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 29, 1981, Ser. No. 316,360

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042228; Aug. 14, 1981, 3132165

Int. Cl.³ B60P *1/64*

U.S. Cl. 414—459 **3 Claims**



1. An over-the-road truck with an exchangeable load carrier comprising:

a load carrier having a front, rear, sides and projecting extensions for support thereof, the sides of said load carrier being parallel to the normal direction of movement of said truck, said sides being substantially completely open to facilitate access to the contents thereof;

a rigid frame having a cavity sized to accept said load carrier, said frame enclosing the front and rear of said load carrier but not enclosing the sides thereof and including at least one beam bridging said cavity;

front and rear axles having wheels mounted thereon and being mounted to said frame, said wheels mounted on said front axle being steerable while said rear wheels are non-steerable;

means supported by said frame and interacting with said projecting extensions for lifting and lowering said load carrier into and from a travel position within said cavity;

latch means attached to said frame for securely supporting and latching said load carrier in said frame when in the travel position independently from operation of said means for lifting;

a driver's cab positioned over said front axle;

a motor mounted behind the cavity in said frame and driving said rear axle; and

control means interconnecting said driver's cab and motor for controlling said motor;

said load carrier having rollers provided on the underside thereof to facilitate removal of said load carrier from said cavity by rolling said carrier transversely to the normal direction of movement of said truck.

4,500,249

SELF-ADJUSTING BOAT TRAILER CRADLE

Lars Johansson, Kalmarsand, S-198 00 Bålsta, Sweden

Filed Feb. 16, 1982, Ser. No. 348,763

Claims priority, application Sweden, Feb. 18, 1981, 8101102

Int. Cl.³ B60P *3/10*

U.S. Cl. 414—534 **2 Claims**

1. A self contained boat trailer cradle adapted to be mounted on a boat trailer chassis having a pair of parallel longitudinal chassis members, said boat trailer cradle comprising:

(a) two parallel girders (1,2) adapted to support said cradle on the pair of parallel longitudinal chassis members (3,4) of a boat trailer chassis;

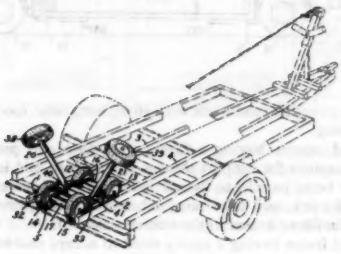
(b) a cradle frame positioned and extending between and supported on said two parallel girders, said cradle frame including:

(i) two parallel frame side members connected with one another over cross members in a manner such that their ends extend outside the cross members;

(ii) two wheel shafts mounted between the free ends of said frame side members of the cradle frame with the ends of the shafts extending into the spaces between the girders and said parallel frame side members and each of said shaft ends carrying a freely rotatable rubber-tired wheel for steering a boat in the course of its hauling up on to the cradle;

(iii) a pair of keel rollers each of which being mounted freely rotatable on its respective shaft between the frame side members of the cradle frame; and

(c) a pair of cradle suspension mechanisms mounted between the frame side members and the girders symmetrically with respect to the longitudinal and transverse axes of the cradle frame, each of said suspension mechanisms comprising a supporting arm extending outwards in the transverse axial direction of the cradle frame, said supporting arm:



(i) being pivotally connected at its inner end, on one hand, via an innermost pivot pin, with the frame side member of the cradle and, on the other hand, via an intermediate pivot pin, with the adjacent girder; and

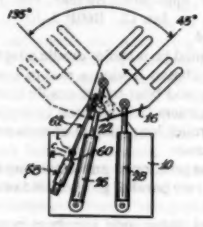
(ii) carrying at its extreme end a rubber-tired wheel; the pivots mounted to said girders constituting fulcrums of said arms thus acting as a pair of double-armed levers, wherein the length of the levers connected with the pivots mounted to said frame side members is governed by the distance between the pivots of the side members of the cradle frame and the respective adjacent girder, whereas each of the extreme levers with its rubber-tired wheel is of a length such that the static moments of the respective extreme levers with the rubber-tired wheel and the inner levers with the cradle coupled thereto are substantially equal, when the lateral support arms are swung outwards horizontally and with the cradle unloaded.

4,500,250

BACKHOE SWING MECHANISM

Herman J. Maurer; Carl O. Pedersen, and Barry C. Nudd, all of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Jun. 7, 1982, Ser. No. 385,784
Int. Cl.³ E02F 3/32
U.S. Cl. 414—695.5 **9 Claims**



1. For an implement having a frame supporting a boom assembly for pivotal movement about a vertical axis, an arrangement for pivoting said boom assembly relative to said frame through an arc comprising:

a pair of hydraulic motors interconnected between said frame and said boom assembly, each motor having first and second ends defining respective expansible fluid chambers, the extension and contraction of said motors pivoting said boom assembly about said vertical axis, each of said motors being fully extended when its respective centerline intersects said vertical axis;

a hydraulic system including a source of fluid under pressure and directional control valve means for selectively directing fluid under pressure from said source to the first end of each of the hydraulic motors,

sequencing valve means, comprising a multi-position spool valve and hydraulic cushioning means, hydraulically joined between the second ends of the hydraulic motors and said control valve means, said spool valve being sequentially positionable in first, second, and third positions,

valve control means comprising linkage means including lost-motion means, connecting said sequencing valve means directly with said boom assembly at said vertical axis thereof whereby pivotal movement of said boom assembly through said arc operates said sequencing valve means via said lost-motion means to alter hydraulic fluid flow between the second ends of said motors and said directional control valve means, and

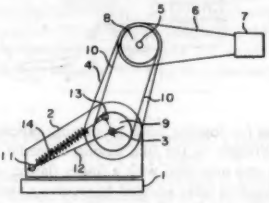
centering means for urging said spool valve from either of said first and third positions toward said second position, said linkage means operating to reposition said spool valve from said second position to either of said first and third positions and cooperating with said centering means to maintain said spool valve in said second position as said boom assembly is moved through a central portion of said arc.

4,500,251

MULTIJOINT MANIPULATOR

Yuichi Kiryu, Tokyo, and Tadashi Sawada, Sagamihara, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 463,016
Claims priority, application Japan, Feb. 5, 1982, 57-17007; Feb. 17, 1982, 57-20823[U]
Int. Cl.³ B66C 23/00, 23/72
U.S. Cl. 414—719 **10 Claims**



1. A multijoint manipulator which comprises:

an upper arm having one end which is pivotally supported by a shoulder joint portion of a main body to be capable of rotation around said shoulder joint portion;

a lower arm having one end which is pivotally supported by an elbow joint portion formed at the other end of said upper arm to be capable of rotation around said elbow joint portion;

a distal device fitted to the distal end of said lower arm;

a first chain wheel fixedly fitted to said lower arm having its center coaxial with the center of revolution of said elbow joint portion;

a second chain wheel rotatably fitted to said shoulder joint portion, the center of said second chain wheel being coax-

ial with the center of revolution of said shoulder joint portion;

a transmitting means for linking said first and second chain wheels to rotate them at the same angle; and

a torque producing means which has one end secured to said main body and the other end secured to said second chain wheel to impart the maximum torque when said lower arm is in the horizontal position and to impart the minimum torque when said lower arm is in the vertical position,

wherein when said lower arm is in the horizontal position, the other end of said torque producing means is at the periphery portion of said second chain wheel on a linear line perpendicular to a line passing through the center of revolution of said shoulder joint portion and said one end secured to said main body,

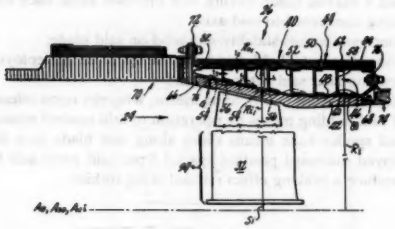
whereby said torque producing means is affected only by the position of said lower arm.

4,500,252

BEAM FOR A CONTAINMENT STRUCTURE

Richard J. Monhardt, Glastonbury; Alfred B. Orr, West Suffield, and Joseph B. Wright, Somers, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1981, Ser. No. 332,694
Int. Cl.³ F01D *21/04*
U.S. Cl. 415—9 **7 Claims**



1. For an axial flow rotary machine, a structrue of the type adapted to position and support a fabric for containment of particles having an axial and radial velocity, which comprises:

an annular beam which is hollow, which extends axially and circumferentially about an axis of symmetry and which has an inner wall, an outer wall, and a plurality of annular plates which are attached to the inner wall and the outer wall and which extend circumferentially about the interior of the beam for stiffening the beam against radial deflection,

wherein the annular beam has a characteristic vibratory pattern at the inner wall including spaced nodes and antinodes, and wherein each annular plate is attached to the inner wall at an antinode.

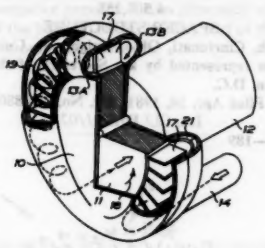
4,500,253

SIDE-CHANNEL PUMP

Johann K. Haberl, Fiskarholmsgränd 2, S-127 41 Skärholmen, Sweden

PCT No. PCT/SE82/00037, § 371 Date Sep. 23, 1982, § 102(e) Date Sep. 23, 1982, PCT Pub. No. WO82/02748, PCT Pub. Date Aug. 19, 1982
PCT Filed Feb. 10, 1982, Ser. No. 433,136
Claims priority, application Sweden, Feb. 10, 1981, 8100913
Int. Cl.³ F04D *5/00*
U.S. Cl. 415—53 T **5 Claims**

1. Side-channel pump comprising an open impeller; a side-channel formed with a semi-circular side wall and having an inlet and an outlet; and a bead projecting substantially axially into the side-channel and located between the inlet and the outlet at an angular distance from the center of the inlet as seen in the rotational direction of the impeller of about 1/5 of the arc over which the side-channel extends from the center of the inlet to the center of the outlet and having a height of about



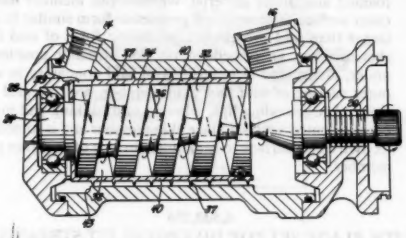
25% to about 40% of the internal radius of the side-channel at least a portion of the bead extending helically in the rotational direction of the gas flow passing through the side channel at a pitch angle ranging from about 10° to about 30°

4,500,254

GAS EXPANSION MOTOR

Edward J. Rozniecki, 31041 Angeline, St. Clair Shores, Mich. 48082

Filed Nov. 8, 1982, Ser. No. 439,665
Int. Cl.³ F01D *5/00*
U.S. Cl. 415—75 **3 Claims**



1. A pressurized gas-expansion motor comprising a housing; spaced bearings carried by the housing and operable to define a rotational axis; a pressure-operated rotor comprising a central elongated shaft and two shaft end sections mounted in the spaced bearings for enabling the rotor on the aforementioned rotational axis; said rotor further comprising an outwardly-projecting helical wall extending circumferentially around and along the central elongated shaft for at least four helix convolutions, and an elongated shroud carried on the helical wall in close adjacency to an inner annular surface of the housing; seal means preventing pressurized gas flow through the annular clearance space between the shroud and housing inner surface; said housing having an inlet opening near one end of the annular shroud for receiving pressurized gas, and an outlet opening near the other end of the annular shroud for discharging depressurized gas; the elongated central shaft, helical wall and annular shroud defining an elongated helical gas passage extending circumferentially around and along the central shaft; said shroud having a gas intake port at its inlet end continuously communicating the gas passage with the housing inlet opening; said intake port extending only a limited distance around the shroud circumference; the defined helical gas passage having a progressively increasing cross-sectional area, measured from the inlet end of the shroud to the outlet end, whereby the gas undergoes a continual expansion and depressurization action while it is moving through the gas passage; the length of the helical gas pressure being related to the initial pressure of the gas received through the housing inlet opening,

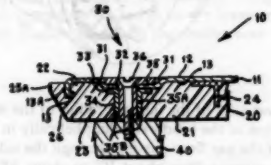
such that the gas exiting through the housing inlet opening is at a relatively low pressure near atmospheric pressure.

4,500,255

SPACER STRUCTURE

George Webb, Cincinnati, Ohio, assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 24, 1981, Ser. No. 256,880
Int. Cl.³ F01D 1/02
U.S. Cl. 415—189 16 Claims



1. A structure useable as a spacer, comprising:

a. a metal face skin member having an inner surface, and aerodynamically configurated outer surface with a centrally positioned concavity therein, and a preselected geometric form with a width, wherein said concavity is positioned transverse to said width, and whereby said concavity constitutes and functions as a rib;

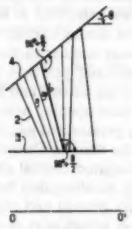
b. and, a backing pad member made of a thermoplastic foamed unicellular material, wherein this member has an outer surface, a preselected geometric form similar to and larger than said preselected geometric form of said face skin member, an embedded rib skin stiffener positioned under, along, and in contact with said concavity in said outer surface of said face skin member, and integral peripheral edge sealing lips, wherein said backing pad member is oriented with said face skin member and is joined by its own outer surface to said inner surface of said face skin member.

4,500,256

GUIDE BLADE SET FOR DIVERGING JET STREAMS IN A STEAM TURBINE

Raymond Bessay, Belfort, and Gilbert Riollet, Paris, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed Mar. 15, 1983, Ser. No. 475,562
Claims priority, application France, Mar. 19, 1982, 82 04687
Int. Cl.³ F01D 19/02
U.S. Cl. 415—191 1 Claim



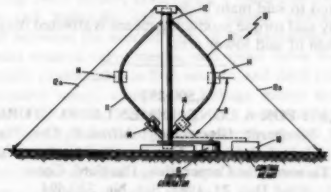
1. A guide blade set for diverging streams in a steam turbine which has blades disposed between a floor plate and a ceiling plate, said floor plate extending generally parallel to the axis of the turbine, said ceiling plate being conical and forming an angle θ with the axis of the turbine, the improvement wherein the blades are curved such that concave and convex surfaces of said blades at one end thereof defined by substantially linear generator lines form an angle of substantially $90° + \theta/2$ with the floor plate, and an angle of substantially $90° + \theta/2$ with said ceiling plate, where θ is the angle of divergence of the jet stream.

4,500,257

WIND TURBINE SPOILER

William N. Sullivan, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 24, 1983, Ser. No. 469,348
Int. Cl.³ F03D 7/06
U.S. Cl. 416—32 15 Claims



1. A wind turbine comprising:

a vertical axis wind turbine including a vertical rotor axis and a curved blade having two opposed ends, each end being connected to said axis;

spoiler vane means slidably mounted on said blade;

holding means to hold said vane means in an undeployed position near said rotor axis; and

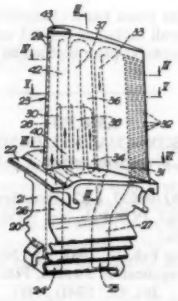
control means for said holding means; whereby upon release of said holding means by operation of said control means, said spoiler vane means slides along said blade to a deployed outboard position spaced from said rotor axis to produce a braking effect on said wind turbine.

4,500,258

COOLED TURBINE BLADE FOR A GAS TURBINE ENGINE

Alec G. Dodd, and Martin Hamblett, both of Derby, England, assignors to Rolls-Royce Limited, London, England

Filed May 24, 1983, Ser. No. 497,585
Claims priority, application United Kingdom, Jun. 8, 1982, 8216584
Int. Cl.³ F01D 5/08
U.S. Cl. 416—97 R 3 Claims



1. A cooled turbine blade for a gas turbine engine comprising an aerofoil having a root end, a tip end and a spanwise extent with convex and concave flanks, said aerofoil having a taper in cross-section from said root end to said tip end with said root

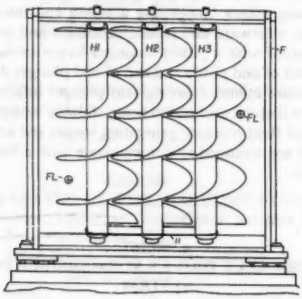
end being thicker than said tip end, a first set of cooling air passages extending spanwise of said aerofoil between said root end and said tip end, a dead central cavity extending from said root end of the aerofoil part way up said spanwise extent of the blade and terminating short of said tip end below upper extremities of said first set of cooling air passages, said aerofoil having a relatively constant metal thickness between said cavity and both of said flanks, said first set of cooling passages forming a part of a multi-pass cooling system and bifurcating to pass between said cavity and both flanks of the aerofoil, said first set of cooling passages being of conventional form outboard of said dead central cavity and splitting at said bifurcation into duplicated passages between said dead central cavity and said both flanks of the aerofoil, and a further cooling passage extending adjacent the leading edge of said aerofoil and from which said dead central cavity extends.

4,500,259

FLUID FLOW ENERGY CONVERTER

Berthold W. Schumacher, 24635 Winona, Dearborn, Mich. 48124

Filed Aug. 18, 1981, Ser. No. 293,857
Int. Cl.³ F03D *3/02*
U.S. Cl. 416—122 **11 Claims**



1. Apparatus for extracting energy from the kinetic energy of an unbounded fluid flow such as wind or water, making use of an array of helicoids, characterized by

(a) the helicoids having all the same pitch angle of between 5° and 36° and having their axes arranged in one plane and parallel to one another,

(b) the spacing of the axes being so chosen that the outer diameters of adjacent helicoid structures overlap, so that the helicoid sheet of the second helicoid structure gets positioned in the open spaces between the sheet of the first helicoid structure, the sheet of the third gets positioned in the open spaces between the sheet of the second, and so forth, so as to present a long, nearly dense looking array to the fluid flow,

(c) means for coupling and synchronizing the rotation of all said helicoil structures, so as to secure the mutual position of said helicoid sheets in their respective spatial relationship as just described, and means to couple their rotation to a common output shaft to which they then deliver their energy, said output shaft being coupled to a device doing useful work,

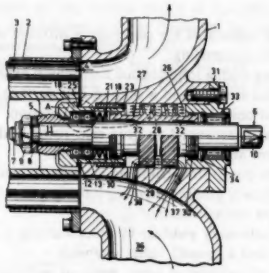
(d) means securing an appropriate angular relationship between the fluid flow vector and the axis of the helicoids, namely so that the flow vector and a radius vector at right angles to the axes of the helicoids form an angle between them of the same order as the pitch angle of the helicoid, so that essentially only one side of the helicoid sheets is impacted by the fluid flow, at an angle to the normal of the sheet surface, thus deflecting the flow without stopping it completely, the helicoid thereby being set in rotation by the recoil forces, as well as on account of the fluid dynamic negative pressure forces generated on the opposite sides of the helicoid sheets by that part of the flow which passes through the structure.

4,500,260

PRESSURE WAVE SUPERCHARGER WITH ROLLING BEARINGS FOR THE ROTOR

Andreas Mayer, Niederrohrdorf, and Adolf Niederer, Untereh-rendingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 25, 1983, Ser. No. 469,992
Claims priority, application Switzerland, Mar. 3, 1982, 1293/82
Int. Cl.³ F04F *11/00*
U.S. Cl. 417—64 **21 Claims**



1. A pressure-wave supercharger, comprising:

a rotor casing having a first end face and a second end face;

a rotor arranged within said rotor casing;

an air casing closing said first end face of said rotor casing and including air induction ducts through which flows induction air and high-pressure discharge ducts;

an exhaust gas casing closing said second end face of said rotor casing and including high-pressure gas supply ducts and low-pressure gas exhaust ducts;

a rotor shaft upon which said rotor is mounted;

a shaft space and a rolling bearing system included in said air casing for accommodating said rotor shaft;

duct means interconnecting said shaft space with said air induction ducts;

said duct means comprising, for each air induction duct of said air induction ducts, both an inlet duct at a front position of said air induction duct and an outlet duct lying behind said inlet duct, looking in the flow direction of the induction air;

said outlet duct issuing into said air induction duct just in front of an entry position of the induction air into said rotor;

said rolling bearing system including a first ball-bearing situated closer to said rotor, a second ball-bearing situated further away from said rotor and a bearing sleeve rigidly fixed in said air casing;

said first ball-bearing being equipped with a first outer ring and said second ball-bearing being equipped with a second outer ring;

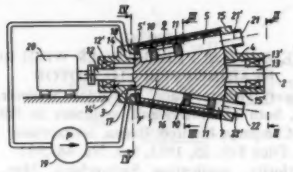
said first outer ring sitting firmly in said bearing sleeve; and

said second outer ring sitting in said bearing sleeve so that it can be displaced axially.

4,500,261
PUMP MEANS FOR PUMPING A MIXTURE OF COARSE-GRAINED MATERIAL AND FLUID

Bengt Ode, and Lars Törnblom, both of Västerås, Sweden, assignors to Ab Asea-Atom, Vasteras, Sweden

Filed Mar. 21, 1983, Ser. No. 477,545
Claims priority, application Sweden, Apr. 7, 1982, 8202248
Int. Cl.³ F04B *23/12, 23/14, 35/04*
U.S. Cl. 417—203 **3 Claims**



1. A pump apparatus for pumping a mixture of liquid and solid material, comprising:

a rotor body with a longitudinal axis which extends between a first end surface and a second end surface of the rotor body and coincides with an axis of rotation;

a drive means arranged to give said rotor body a rotating movement about said axis of rotation;

an auxiliary pump for providing a pressure medium;

a first stationary guiding member having a first inlet channel and a first outlet channel;

a second stationary guiding member having a second inlet channel and a second outlet channel;

a plurality of cylindrical bores made in said rotor body and extending between said end surfaces; and,

a plurality of piston members, each of said bores containing a corresponding piston member, and each piston member comprising a motor piston portion facing said first guiding member and a pump piston portion facing said second guiding member;

wherein said first guiding member is disposed adjacent to said first end surface and said second guiding member is disposed adjacent to said second end surface;

wherein said first inlet channel and said first outlet channel are connected to said auxiliary pump;

wherein said second inlet channel is directly connected to a conveyor tube for said mixture and said second outlet channel is connectible to an outlet conduit for said mixture;

wherein said conveyor tube, via an opening in the tube wall, is connected to a feeding pocket arranged above the conveyor tube, said conveyor tube comprising a conveyor worm one end of which is insertable into said second inlet channel;

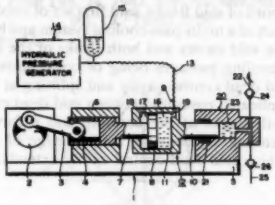
wherein each one of the channels of said first guiding member is arranged to be in a pressure-transmitting communication with a corresponding channel in said second guiding member more than one time during a rotor revolution, each time via one of said bores; and,

wherein said rotor body is substantially formed as a truncated cone, the radial extension of said second end surface being greater than the radial extension of said first end surface, and said bores being in diverging relation to each other in a direction towards said second guiding member.

4,500,262
VARIABLE PRESSURE AND DISPLACEMENT RECIPROCATING PUMP

Kenji Sugino, and Yukiaki Nagata, both of Uozu, Japan, assignors to Sugino Machine Limited, Uozu, Japan

Filed Apr. 24, 1980, Ser. No. 143,317
Claims priority, application Japan, May 8, 1979, 54-55212
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—214 **5 Claims**



1. In a positive displacement reciprocating pump having an inlet check valve and a discharge check valve wherein a plunger is reciprocated in a cylinder through a crank shaft, a connecting rod and a crosshead, means for varying pressure and displacement of said reciprocating pump characterized in that said crosshead and said plunger are coupled to each other by cushioning means comprising a piston rod integrally extended from a forward end of said crosshead and provided at the end thereof with a piston having a larger cross-sectional area than that of said piston rod and of said plunger disposed in a fluid pressure cylinder having said plunger attached to the forward end thereof, said piston being slidably mounted in said cylinder, and fluid pressure generating means and an accumulator which are arranged to communicate with a head side of said cylinder.

4,500,263
ELECTRICALLY DRIVEN SUBMERSIBLE PUMP SYSTEM

Frank Mohn, London, England, assignor to Framo Developments (UK) Limited, London, England

Continuation of Ser. No. 366,695, Apr. 8, 1982, abandoned. This application Jul. 9, 1984, Ser. No. 629,733
Claims priority, application United Kingdom, Apr. 10, 1981, 8111368; Feb. 19, 1982, 8204943
Int. Cl.³ F04B *39/06*
U.S. Cl. 417—360 **12 Claims**

1. For use in the pipe stack of a submersible pump system having a pump head with an electrically driven drive means for an impeller at the lower end of the said pipe stack, a pipe stack section comprising:

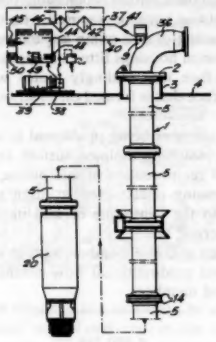
a guide pipe defining a duct for guiding a fluid pumped by the system,

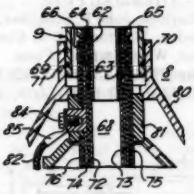
a plurality of electrical conductors for conveying electrical power to said pump head drive means, and

a further pipe located around said conductors with clearance for dielectric liquid for insulation of said conductors,

each of said guide pipe, said further pipe and said conductors being adapted, at each end of said pipe section, for releaseable connection respectively with a guide pipe, a further pipe, and conductors of co-operating pipe stack sections, whereby said pipe stack can be assembled in a desired length from a selected plurality of said pipe stack sections, said conductors and said further pipe cooperating to define a supply path and a return path along said section for circulation of dielectric liquid in said pipe stack, each of said plurality of conductors comprising a tubular conduc-

tor of which the interior provides one of said supply and return paths, the other of said supply and return paths





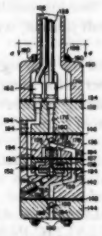
being defined between said tubular conductors and said further pipe.

4,500,264

AIR OPERATED DIAPHRAGM PUMP SYSTEM

Georg H. Lindner, Vlissingen, Netherlands, assignor to M&T Chemicals Inc., Woodbridge, N.J.

Filed Jun. 4, 1982, Ser. No. 385,176
Int. Cl.³ B67D *5/50*
U.S. Cl. 417—395 **3 Claims**



1. In combination, an upwardly opening receptacle, liquid stored within said receptacle, a lid for said receptacle, said lid having an aperture formed therethrough, and a diaphragm pump assembly for withdrawing the liquid from said receptacle, said assembly comprising:

(a) a diaphragm pump submerged within said receptacle below the level of the liquid,

(b) said pump having a body with an inlet passage for admitting liquid, an outlet passage for discharging liquid and a pumping chamber intermediate said inlet and outlet passage for receiving liquid there,

(c) a first valve controlling the admission of liquid into the pumping chamber and a second valve controlling the discharge of liquid from said pumping chamber,

(d) a pair of spaced diaphragms extending within the pump body to define a first pressure chamber therebetween,

(e) a displacer secured to said diaphragms, said displaced being movable within pumping chamber,

(f) an extension sleeve extending vertically upwardly from the pump through the aperture in said lid to a position above the receptacle,

(g) a pulse generator and a supply of compressed air for pressurizing same, said pulse generator comprising a circuit of interconnected pneumatic logic elements, at least one of said logic elements comprising a bistable element with two outlet channels, and said circuit further including an inverter connected to one of the outlet channels of said bistable element, and

(h) inlet conduit means passing through said extension sleeve for connecting said pulse generator to said pump body to transmit pressurized pulses to said diaphragms for driving said plunger into said pumping chamber;

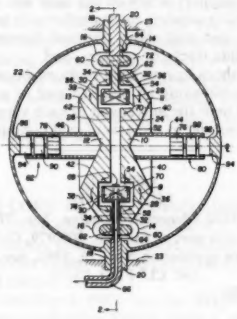
(i) outlet conduit means passing through said extension sleeve for discharging the liquid forced out of said pumping chamber in said pump body by said displacer.

4,500,265

MAGNETICALLY ACTUATED COMPRESSOR

Jack Evans, Baltimore, and Philip A. Studer, Silver Spring, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 28, 1983, Ser. No. 461,724
Int. Cl.³ F04B *17/04;* **H02K** *33/14;* **F01B** *19/00;* **F25B** *9/00*
U.S. Cl. 417—417 **14 Claims**



1. Fluid compressor apparatus substantially free of mechanical vibrations, comprising in combination:

a pair of mutually opposing movable magnetizable bodies (**10, 12**) located in a body housing (**22**),

a sealed volume of a working fluid under pressure located between said pair of bodies (**10, 12**) which urges said bodies apart;

means (**56**) in relatively close proximity to said pair of magnetizable bodies (**10, 12**) for periodically generating a single magnetic field interlinking said bodies, said single magnetic field passing through said magnetizable bodies and producing mutually attractive magnetic forces therebetween for causing said bodies to be drawn together, whereupon said volume alternately compresses and expands to respectively increase and decrease the pressure of the working fluid to generate a compression wave therein; and

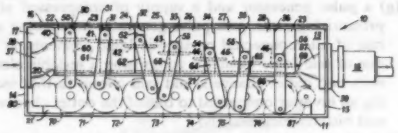
outlet means (**66**) for coupling said compression wave generated in the gas volume out of the body housing (**22**), said outlet means being located intermediate said magnetizable bodies.

4,500,266

LINEAR PERISTALTIC PUMP

Donald L. Cummins, Hopewell, Va., assignor to AMF Incorporated, White Plains, N.Y.

Continuation of Ser. No. 305,011, Sep. 24, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,004
Int. Cl.[3] F04B *43/12, 45/08*
U.S. Cl. 417—474 11 Claims



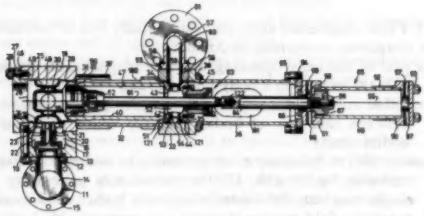
1. A pump comprising:
a housing defining a chamber;
a linear flexible conduit disposed in said chamber having an inlet at one end of said housing to receive material to be moved and a discharge for such material at the other end of said housing;
a fixed surface in said chamber supporting said conduit;
a plurality of shoes disposed in series and movable along linear axes normal to the axis of said conduit thereby compressing said conduit against said support surface by each of said shoes forming a closure of said conduit;
means for moving said shoes in a predetermined sequence forming closures progressively positioned along said conduit to move material from the conduit inlet to the conduit discharge;
laterally spaced guide means including opposed pairs of guide tracks or surfaces extending substantially perpendicular to the support suface on the same side of said surface as said flexible conduit and on either side of said conduit;
said conduit and said shoes disposed between said guide pairs of guide tracks or surfaces; and
each of said shoes having stem portions extending into and being movable along an opposed pair of guide tracks or surfaces to limit the movement of each shoe along an axis extending normal to the axis of said conduit.

4,500,267

MUD PUMP

J. C. Birdwell, 8535 Gleacrest, Houston, Tex. 77061

Continuation-in-part of Ser. No. 309,979, Oct. 8, 1981, abandoned. This application Nov. 16, 1983, Ser. No. 552,400
Int. Cl.[3] F16J *10/04*
U.S. Cl. 417—552 12 Claims



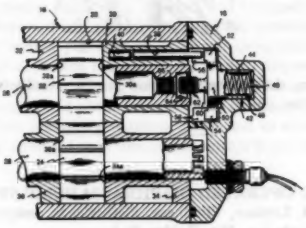
2. Pump apparatus comprising:
two or more cylinders each having a bore with a piston slidably and sealingly disposed therein;
connection means to each piston for receiving reciprocating driving means;
each said piston dividing each said cylinder into first and second expansion chambers with at least one of said expansion chambers being fitted with inlet and outlet unidirectional flow means positioned to enable fluid to be pumped therethrough said flow means as said pistons are reciprocated;
said pistons disposed within replaceable piston housings;
each of said piston housings secured within the confines of an outer housing of said pump apparatus;
each of said piston housings fitted on opposing ends with an inclined surface that sealingly mates with a matching inclined surface that is formed on an adjourning end member;
each said end member being positioned to align the centerline of said matching inclined surface concentric to the centerline of reciprocation of said piston;
said piston housing constructed to align said piston bore concentric to the centerline of said inclined surface on each end thereof; and
means to tighten said end members against said piston housing, with said unidirectional flow means being separate from said end members.

4,500,268

ROTARY PUMP HAVING BRAKE MEANS WITH THERMAL FUSE

Jack G. Sundberg, Meriden; John P. Schaffner, South Windsor, and Daniel J. Conlon, Hartford, all of Conn., assignors to Chandler Evans Inc, West Hartford, Conn.

Filed Sep. 30, 1982, Ser. No. 430,828
Int. Cl.[3] F04C *2/18, 15/00;* B60T *13/04;* F04B *49/02*
U.S. Cl. 418—1 8 Claims



1. A method of preventing prolonged dry running of a pump having a shaft journal mounted for rotation in the pump, a rotating pumping member carried by the shaft journal for rotation therewith and a bearing positioned in the pump for rotatably mounting the shaft journal, which method comprises the steps of:
placing a thermal fuse in the bearing; and
placing a braking member in the pump adjacent an end of the shaft journal, the braking member being adapted to engage and stop rotation of the shaft journal upon melting of the thermal fuse.

4,500,269

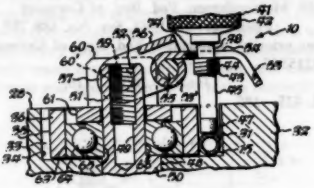
INTEGRAL TUBE-LOADING ASSEMBLY FOR PERISTALTIC PUMP

Thurman S. Jess, Lydonville, N.Y., assignor to Cormed, Inc., Medina, N.Y.

Filed Nov. 30, 1983, Ser. No. 556,370
Int. Cl.[3] F04B *43/12, 45/08*
U.S. Cl. 418—45 12 Claims

1. In a peristaltic pump having a housing with an inner wall, a rotor having an outer wall, a flexible tube for insertion between said inner and outer walls, and means mounting said rotor for eccentric movement within said housing with said inner wall spaced from said outer wall, said eccentric movement causing a portion of said outer wall of said rotor to progressively recede from said inner wall during rotation of said rotor so as to accommodate said flexible tube in a relatively uncompressed state, the improvement comprising a device for

inserting said tube between said inner and outer walls comprising a pin member including a tube inserting end and a digital grasping end and a central portion therebetween, and linkage means mounting said pin member relative to said rotor for



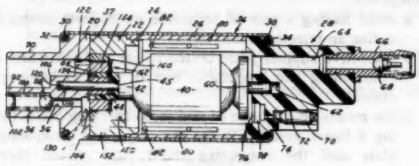
causing said tube inserting end to always be aligned with said portion of said outer wall of said rotor so that the tube inserting end of said pin member can progressively press portions of said tube in a relatively uncompressed state between said inner and outer walls as said rotor is caused to rotate.

4,500,270

GEAR ROTOR FUEL PUMP

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Jul. 29, 1982, Ser. No. 403,097
Int. Cl.³ F04B *23/14, 17/00*
U.S. Cl. 418—133 **3 Claims**



1. In a gear rotor pump having an outer gear rotor with pumping recesses and an inner gear rotor driven within an eccentric opening in a cam ring by a rotating power input unit, that improvement in construction which comprises:

(a) an inlet housing having a liquid inlet at one end and a flat pump housing wall at the other end and a pump inlet and outlet ports circumferentially spaced therein,

(b) a gear assembly mounted for rotation including an inner gear rotor rotatable about a first axis and an outer gear rotor within said cam ring rotatable with said inner gear rotor, each said rotor having equal axial dimensions with one end lying against said flat housing wall,

(c) first flexible plate means rotatable with said assembly radially overlying the other end of said inner and outer gear rotor assembly to close the pumping recesses at said other end and pressing said assembly against said wall, and

(d) second means for rotatably driving said first flexible plate means and said inner gear rotor to cause rotation of said outer gear rotor and a consequent pumping action,

(e) means is provided to mount said gear assembly within said cam ring comprising a non-rotating stub shaft concentric with said first axis and mounted in said inlet housing and projecting perpendicularly from said flat wall rotatably mounting said inner rotor through a central opening in said inner rotor, the stub shaft being independent of and unsupported by said power input unit and said second means,

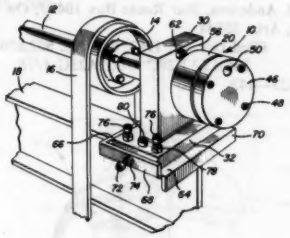
(f) the second means comprising a rotating means on said power unit rotatable independent of said stub shaft having a body portion exerting axial pressure against said flexible plate means and circumferentially spaced finger projections positioned outwardly of said first axis and projecting into receiving recesses in said inner gear rotor.

4,500,271

UNDERWATER PELLETIZER WITH ADJUSTABLE BLADE ASSEMBLY

Donald W. Smith, Fincastle, Va., assignor to Gala Industries, Inc., Eagle Rock, Va.

Filed Dec. 6, 1983, Ser. No. 558,470
Int. Cl.³ B29C *17/14;* B29F *3/00*
U.S. Cl. 425—67 **6 Claims**



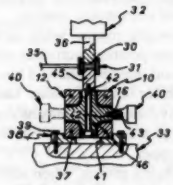
1. In an underwater pelletizer including a rotatable cutter blade assembly associated with a cutting surface of a die for forming pellets and including a drive shaft, means adjustably supporting the drive shaft for adjustable movement axially of the axis of rotation and radially of the axis of rotation for adjusting the cutter blade assembly in relation to the cutting surface on the die said adjustably supporting means being manually operable to accurately adjust the position of the cutter blade assembly and said adjustably supporting means including a bearing journalling the shaft, a bearing housing mounting the bearing and a bearing support plate, said bearing housing being threaded through the bearing support plate for rotational movement of the bearing housing and axial movement of the bearing and shaft.

4,500,272

FLOATING CORE TRANSMISSION MEMBER FOR ULTRASONIC ASSISTANCE

Jean-Francois Astier, Boisseuil Feytiat; Louis Bessaguet, Limoges, and Michel Laplanche, Feytiat, all of France, assignors to Legrand, Limoges, France

Filed May 4, 1983, Ser. No. 491,445
Claims priority, application France, May 4, 1982, 82 07701
Int. Cl.³ B30B *11/02*
U.S. Cl. 425—78 **19 Claims**



1. In a transmission member for ultrasonic vibrations said transmission member being of the type including a casing, a floating core free to move in all directions within said casing, said core having at least two arms disposed at an angle to one another, said at least two arms separately projecting towards the exterior of said casing, one of said arms having means for connection to an ultrasonic driving member and another of said arms having means for connection to a driven member,

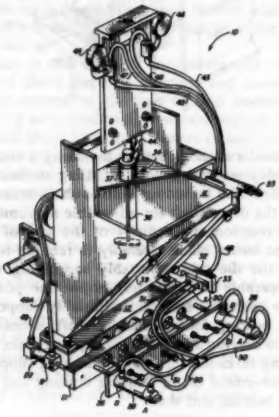
and said casing defining an internal housing having a configuration which corrresponds to that of the exterior of said core and being spaced from said core, an improvement comprising an insulating layer positioned between said floating core and walls of said internal housing in the casing in which said floating core is disposed, said insulating layer being formed of a solid elastic material filling said space in said casing between said casing and said core.

4,500,273

AUTOMATIC POURING AND DISPENSING MACHINE FOR MANUFACTURING HARD AND SOFT CANDY

Dennis M. Anderson, Star Route Box 1049J, Ox Bow Estates, Payson, Ariz. 85541

Filed Dec. 19, 1983, Ser. No. 562,870
Int. Cl.³ B29C *5/00*; A23G *3/18*
U.S. Cl. 425—143 **11 Claims**



1. An apparatus for measuring and dispensing sugar syrups into a mold comprising:

a mounting block defining a cavity therein having first input and output ports,

a hopper for dispensing syrups through said first input port into said cavity,

a dispensing valve mounted in said cavity,

said valve comprising a cylinder movable in said cavity and a piston means movable in said cylinder,

said cylinder having second input and output ports,

first and second fluid operable means,

first and second sequencing means,

said first sequencing means, when activated by fluid under pressure in one position, activates said first cylinder means to connect said inlet port of said block with said inlet port of said cylinder and activates said second sequencing means to move said piston means outwardly of said cylinder to enlarge a cavity in said cylinder to receive syrup from said hopper,

said first sequencing means, when activated to another position, activating said first cylinder means to move said cylinder to close said first inlet port in said block and said second inlet port in said cylinder and to open said second outlet port in said cylinders and place it in alignment with said first outlet port in said block,

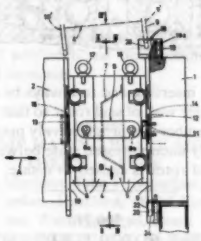
said first sequencing means, when activated to said another position, activating said second sequencing means to cause said piston means to move inwardly of said cylinder to force syrup in the cavity in said cylinder out of said first and second outlet ports into a mold.

4,500,274

QUICK-CHANGE MOLD ASSEMBLY FOR INJECTION-MOLDING MACHINES

Wilhelm Cyriax, Meinerzhagen; Gerhard Tamboers, Plettenburg, and Johannes Holzschuh, Meinerzhagen, all of Fed. Rep. of Germany, assignors to Battenfeld Maschinenfabriken GmbH, Meinerzhagen, Fed. Rep. of Germany

Filed Apr. 26, 1983, Ser. No. 488,755
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1982, 3215567
Int. Cl.³ B29C *1/16*
U.S. Cl. 425—185 **19 Claims**



1. In an injection-molding machine having a pair of mold-carrying plates at least one of which is adapted to be displaced toward and away from the other in a mold-opening and a mold-closing direction, a quick-change mold system which comprises:

a mold having a pair of separable mold parts adapted to define an injection mold cavity;

a respective adapter plate bolted to each of said parts and confronting the respective one of said mold-carrying plates;

guide means on only one of said mold-carrying plates forming a linear guide path for the respective mold-adapter plate and the respective mold part affixed thereto whereby said mold between said adapter plates can be shifted along said path between said mold-carrying plates transversely to said direction;

latch means for coupling said parts together in a closed position of said mold for introduction of said mold between said mold-carrying plates into and for withdrawal out of position in said machine;

abutment means on said one of said mold-carrying plates transverse to said direction forming a stop for at least one of said adapter plates along said path thereby aligning said one of said adapter plates with the respective mold-carrying plate; and

locking means on said mold-carrying plates for engagement with said adapter plates to retain said adapter plates against the respective mold-carrying plates during opening and closing of the mold, said locking means including a plurality of releasable clamps on the other of said mold-carrying plates shiftable to engage over the confronting adapter plate.

4,500,275

QUICK CHANGE LOCATOR CLAMP ASSEMBLY FOR PLASTIC MOLDING MACHINE

Edward A. Ruhl, Southfield, Mich., assignor to Sharp Die & Mold Company, Inc., a subsidiary of R & R Plastic Material, Inc., Fraser, Mich.

Filed Dec. 23, 1983, Ser. No. 564,686
Int. Cl.³ B29F *1/06*
U.S. Cl. 425—192 R **15 Claims**

1. In a plastic or die cast molding machine having opposed stationary and movable platens adapted to receive, mount and support a sectional plastic molding die having opposed station-

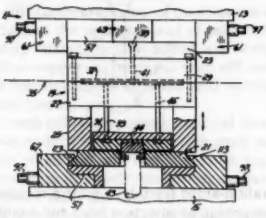
ary and movable guidably interconnected clamps plates comprising;

opposed inwardly facing symmetrical quick change locator clamp assemblies mounted upon said platens;

each clamp assembly including a body plate bearing against and secured to a platen;

laterally spaced index pins mounted upon said body plate and projecting outwardly thereof;

there being correspondingly spaced keyhole slots within the corresponding edges of said clamp plates adapted to cooperatively receive said pins for locating said clamp plates relative to and against said body plates respectively;



longitudinally spaced opposed inward directed pairs of plate clamps adjustably and guidably mounted upon opposite sides of said body plate adapted to receive and retainingly engage opposite sides of a clamp plate;

and rotatable screw means interconnecting each pair of clamps rotatable in one direction for simultaneously moving each pair of clamps inwardly to operatively and retainingly engage a clamp plate for securing said clamp plates to said platens respectively;

and alternately rotatable in the opposite direction for moving each pair of clamps outwardly to disengage said clamp plates to facilitate removal of said sectional die and clamp plates from said platens.

4,500,276

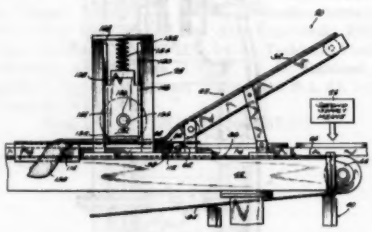
APPARATUS FOR MAKING DEEP DISH PIZZA CRUSTS OR THE LIKE

Miles R. Cherkasky, 833 E. Washington St., Appleton, Wis. 54912, and Ernest V. Canamero, Green Bay, Wis., assignors to Miles R. Cherkasky, Appleton, Wis.

Filed Mar. 7, 1983, Ser. No. 472,555

Int. Cl.³ A21C *3/02, 9/08, 11/10*

U.S. Cl. 425—297 **9 Claims**



1. Automated apparatus for forming pie crusts, comprising first supply means for providing a ribbon of dough; conveyor means comprising plural flight plates, each flight plate including a cutting ring and support means within said cutting ring for supporting a pie pan interiorly of said ring; second supply means for delivering a pie pan to each said support means; anvil means for urging said ribbon of dough against each said cutting ring, thereby severing disks of dough from said ribbon and allowing each said disk to drop into the associated pan; and fluid reciprocated diaphragm means capable of being distended for pressing each said disk into the corresponding pan in conforming relation and capable of being withdrawn for separating from said disk.

4,500,277

APPARATUS FOR THERMOFORMING THERMOPLASTIC SHEET MATERIALS

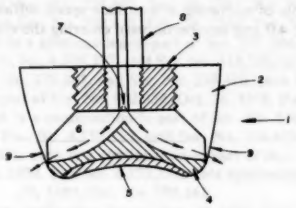
Lance W. Bullock, Wonga Park; Josip Vlahek, and Ferenc Kovacs, both of Tullamarine, all of Australia, assignors to W. R. Grace Australia Limited, Fawkner, Australia

Filed Jan. 4, 1983, Ser. No. 455,618

Claims priority, application Australia, Mar. 2, 1982, 2922/82

Int. Cl.³ B29C *17/04, 17/03*

U.S. Cl. 425—387.1 **12 Claims**



1. A thermoforming tool adapted to selectively distribute and stretch a heated thermoplastic sheet material comprising:

a body portion comprising a sidewall means having an internal surface defining at least one cavity and an external surface adapted to contact said heated thermoplastic sheet material;

at least one insert portion having an external surface adapted to contact said heated thermoplastic sheet material, said insert being retainingly held by said sidewall means and having an internal surface co-operating with said internal surface of said body portion to define a hollow internal chamber;

inlet means adapted to admit pressurized air into said chamber;

wherein the surface defining the internal chamber is configured to direct circulation of pressurized air admitted into said chamber from said inlet means initially across said internal surface of said insert portion to said sidewall means;

wherein the thermal conductivity of said insert portion is different from the thermal conductivity of said body portion and whereby said body portion and said insert portion are adapted to chill said heated thermoplastic sheet material and the rate of chilling of said heated thermoplastic sheet material by said insert portion is different from the rate of chilling of said heated thermoplastic sheet material by said body portion.

4,500,278

YARN HEAT TREATMENT APPARATUS

Stanley R. Cochran, Midlothian, Va., and Francis W. Strahorn, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

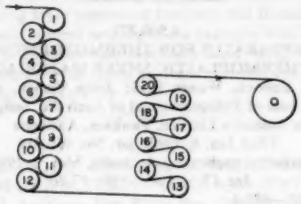
Filed Apr. 22, 1983, Ser. No. 487,897

Int. Cl.³ B29C *25/00*

U.S. Cl. 425—445 **2 Claims**

1. Apparatus for heat treating para-aramid filaments at high speed comprising a staggered array of at least 3 closely spaced heated rolls having diameters of no more than 38.1 cm capable of operating at a first surface speed in excess of 274 m/min and surface temperatures of 175°-300° C. followed by a second staggered array of at least 3 closely spaced heated rolls having diameters of no more than 38.1 cm capable of operating at a surface speed in excess of the surface speed of the first array of

rolls and having surface temperatures of 175°–300° C. and a third staggered array of at least 3 closely spaced constant-tem-



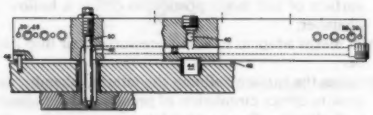
perature cooling rolls having diameters of less than 30.5 cm capable of operating at a surface speed sufficient to maintain 0.6 to 4.0 gpd tension on yarn entering the cooling rolls.

4,500,279

HEAT PIPE MANIFOLD SYSTEM

Richard D. Devellian, Rockport, and Paul M. Swenson, Gloucester, both of Mass., assignors to Kona Corporation, Gloucester, Mass.

Filed Jul. 6, 1983, Ser. No. 510,440
Int. Cl.³ B29F *1/03*
U.S. Cl. 425—548 **15 Claims**



1. A hot manifold system for use between the melt input and the cavity portion of a hot runner mold comprising:

(a) an elongated block member having a top, a bottom, a left end and a right end;

(b) a first portion of said block defining within part thereof a runner channel through which molten material is adapted to flow, said runner channel extending from said melt input in the top of said block therethrough to at least one output in the bottom of said block to the cavity portion of said mold;

(c) a second portion of said block adjacent one end thereof;

(d) a heat source in direct thermal contact with said second portion;

(e) a first plurality of elongated isothermal heat pipes disposed within said block;

(f) said heat pipes extending from within said second portion of said block into said first portion of said block the left to right length thereof such that said heat pipes are substantially uniformly disposed within said first portion of said block relative to each other in proximate relation to said runner channel;

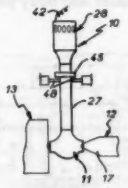
(g) whereby the temperature of said block may be maintained at a uniform level regardless of factors tending to vary such uniformity by the self compensating variation in the rate of change of state of the operating fluid contained in said heat pipes.

4,500,280

VIBRATION-AIDED FEED DEVICE FOR A MOLDING APPARATUS

Jean-Francois Astier, Boisseuil Feytiat; Louis Bessaguet, Limoges, and Michel LaPlanche, Feytiat, all of France, assignors to Legrand, Limoges, France

Filed Jul. 13, 1983, Ser. No. 513,385
Claims priority, application France, Jul. 13, 1982, 82 12279
Int. Cl.³ B29F *1/03*; B29C *11/00*
U.S. Cl. 425—569 **27 Claims**



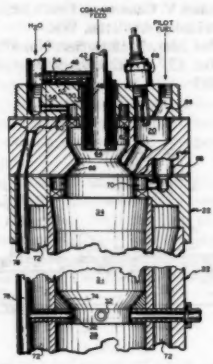
1. A vibration-aided feed device for a molding apparatus of the kind comprising an injection head and a mold, a feed channel for bringing said injection head into communication with said mold, said feed device comprising a connecting body having a distribution channel defining at least part of said feed channel, a laterally extending vibrating arm linked to said connecting body, a vibration generator coupled to said vibrating arm for imparting vibrations to said connecting body without substantially increasing temperatures in said distribution channel, and resilient means floatingly mounting said connecting body for permitting vibration thereof relative to said injection head and said mold.

4,500,281

BURNING OF FUELS

David H. Beardmore, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 2, 1982, Ser. No. 403,979
Int. Cl.³ F23J *7/00*
U.S. Cl. 431—3 **18 Claims**



1. A method of burning a fuel, containing significant amounts of NO_x precursors, comprising:

(a) passing said fuel through at least three serially connected combustion zones in open communication with one another, including; at least two fuel-rich zones and a last fuel-lean zone;

(b) adding a first volume of combustion-supporting material adjacent the upstream end of the first of said fuel-rich zones and intimately mixing the thus added first volume of

combustion-supporting material with all of said fuel adjacent said upstream end of said first of said fuel-rich zones;

(c) adding an additional volume of combustion-supporting material adjacent the upstream end of each of the remaining fuel-rich zones and intimately mixing the thus added additional volume of combustion-supporting material with effluent from the immediately preceeding fuel-rich zone adjacent said upstream end of each of said remaining fuel-rich zones;

(d) the total combustion-supporting material thus added to the upstream end of said first fuel-rich zone and said remaining fuel-rich zones, together with said fuel, resulting in a fuel/combustion-supporting material equivalence ratio greater than 1.0;

(e) adding a still further volume of combustion-supporting material adjacent the upstream end of said fuel-lean zone and intimately mixing the thus added still further volume of combustion-supporting material with effluent from the last of said fuel-rich zones adjacent said upstream end of said fuel-lean zone;

(f) the total combustion-supporting material thus added to the upstream ends of said first fuel-rich zone, said remaining fuel-rich zones and said fuel-lean zone, together with said fuel, resulting in a fuel/combustion-supporting material equivalence ratio less than 1.0;

(g) providing an outlet from each combustion zone of substantially less cross-sectional area than the cross-sectional area of the beginning of the next succeeding combustion zone and abruptly terminating more fuel-rich combustion adjacent the downstream end of each of a preceeding one of said combustion zones and initiating less fuel-rich combustion adjacent the upstream end of each of an immediately succeeding one of said combustion zones, at least in part, by thus adding combustion-supporting material to the effluent of said preceding one of said combustion zones as a plurality of radial jets toward the center of said combustion zone, whereby at least three clearly defined combustion zones are formed;

(h) adding a catalytic amount of a combustion catalyst to the thus formed mixture of said fuel and said first volume of combustion-supporting material adjacent said upstream end of said first of said fuel-rich zones; and

(i) burning said fuel in the presence of said combustion-supporting material and said combustion catalyst in a serial manner in said at least three combustion zones.

4,500,282

BURNER GUIDE VANE DEVICE

Vladislav Y. Eschenko, Tashavtomash-2, 15, kv. 20; Irsali K. Musaev, kvartal 19, 10, kv. 39; Zakhidzhan S. Talibdzhanov, kvartal TS 17/18, 7, kv. 26, all of Tashkent; Viktor A. Leonov, ulitsa Alishera Navoi, 21/6, kv. 55, Dushanbe; Anatoly D. Bobrov, ulitsa Dimitrova, 5, kv. 132, Ulyanovsk; Efim I. Kirovsky, Chilanzar, kvartal 13, 3, kv. 62, Tashkent; Vladimir A. Gritsenko, Kara-Kamysh, 2/4, 35, kv. 48, Tashkent, and Alexandr V. Golovanov, massiv Junus-Abad B-1, 63, kv. 73, Tashkent, all of U.S.S.R.

Filed May 27, 1981, Ser. No. 267,477

Int. Cl.³ F23M *9/00*

U.S. Cl. 431—184 **4 Claims**

1. A burner guide vane device for use with a burner nozzle comprising: a housing having an inlet pipe and an outlet pipe; a cylindrical swirl chamber defined by said housing; equidimensional spaced stationary segments positioned within said housing forming gas inlet ports arranged symmetrically in diametrical opposition to each other; and pivotable vane units mounted at their central portions on respective axles positioned centrally of said gas inlet ports each said pivotable vane units being comprised of two parts, each part of each vane unit being independently pivotable around its said respective axle along an inner edge of each said part.

4,500,283

INFRA-RED GENERATORS AND USE

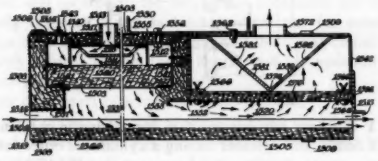
Thomas M. Smith, 1415 Golf Rd., Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 435,512, Oct. 20, 1982, Ser. No. 312,730, Oct. 19, 1981, Pat. No. 4,443,185, Ser. No. 292,167, Aug. 12, 1981, Ser. No. 279,081, Jun. 30, 1981, Pat. No. 4,416,618, and Ser. No. 238,418, Feb. 26, 1981, Pat. No. 4,447,205, each is a continuation-in-part of Ser. No. 186,491, Sep. 12, 1980, Pat. No. 4,378,207, said Ser. No. 312,730, Ser. No. 292,167, Ser. No. 279,081, and Ser. No. 238,418, each is a continuation-in-part of Ser. No. 952,332, Oct. 18, 1978, Pat. No. 4,326,843, which is a continuation-in-part of Ser. No. 906,229, May 15, 1978, Pat. No. 4,157,155, said Ser. No. 238,418, and Ser. No. 186,491, each is a continuation-in-part of Ser. No. 94,901, Nov. 16, 1979, Pat. No. 4,272,238. This application Jun. 29, 1983, Ser. No. 509,161

Claims priority, application Japan, Jun. 29, 1982, 57-110884; New Zealand, Aug. 11, 1982, 201562

Int. Cl.³ F23D *13/12*

U.S. Cl. 431—328 **3 Claims**



1. A gas-fired infra-red-generating burner having a combustion gas plenum covered by a porous panel secured to a metal burner body the exterior of which is covered with exposed thermal insulation blocks, and those blocks are held in place by wire screening wrapped around the blocks, the burner including means clamping edges of the screen in place.

4,500,284

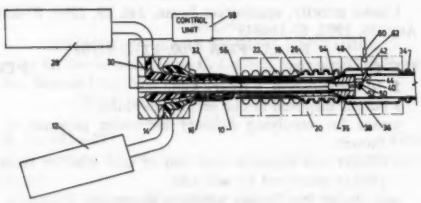
FORMING SINGLE WALL BELLS IN DOUBLE WALL PIPE

Manfred A. A. Lupke, 35 Ironshield Cres., Thornhill, Canada L3T 3K7

Filed Sep. 16, 1983, Ser. No. 532,857

Int. Cl.³ B29C *5/06, 17/07, 17/14;* B29D *23/03*

U.S. Cl. 425—511 **2 Claims**



1. An apparatus for producing a double-walled thermoplastic pipe having a corrugated outer wall and a substantially

smooth inner wall secured to the latter, including extruders for said walls, a core plug over which the inner wall is extruded, and a travelling mold defining a cavity having corrugated sections, wherein the latter are separated with at least one bell section to produce accordingly said outer wall with corrugated and bell sections means for conforming said outer wall to said cavity, said plug being provided with a cutter mounted downstream and having an actuator to puncture the inner wall in said bell section in order to admit air into a chamber of the latter between its outer and inner walls.

4,500,285

ARRANGEMENT FOR MOUNTING A BARREL RING ON THE CASTING OF A ROTARY CYLINDER

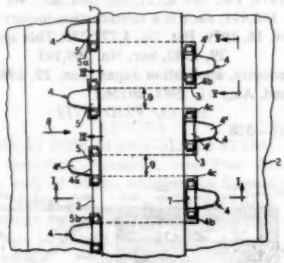
Fred Klotmann, Cologne, and Hubert Ramesohl, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Jan. 26, 1983, Ser. No. 461,167

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1982, 3203241

Int. Cl.³ F27B *7/00*; **D06F** *58/00*; **F16C** *13/00*

U.S. Cl. 432—103 **12 Claims**



1. A rotary kiln construction comprising in combination:

a rotary kiln cylinder having a cylindrical outer surface;

an annular bearing ring for supporting the kiln in rotation and having an inner circumference larger than the outer circumference of the cylinder;

a plurality of spacing plates located between the ring and cylinder and circumferentially spaced from each other; and

support elements at each axial side of the bearing ring secured to the outer surface of the cylinder having retaining elements projecting on both circumferential sides of the plates and being radially outward of the plates to provide radial inward support to the plate ends.

4,500,286

PRIMARY AIR SUPPLY UNIT OF ROTARY KILN

Hiroshi Nagai, Kanagawa, Japan, assignor to Nippon Furnace Kogyo Co., Ltd. and Chichibu Cement Co. Ltd., both of Tokyo, Japan

Filed Jun. 23, 1983, Ser. No. 507,186

Claims priority, application Japan, Jul. 29, 1982, 57-131109; Aug. 26, 1982, 57-146949

Int. Cl.³ F27B *7/02*; **F27D** *15/02*

U.S. Cl. 432—106 **6 Claims**

1. In combination, a rotary kiln,

a burner disposed at one end of said kiln,

means for supplying primary air under pressure to said burner,

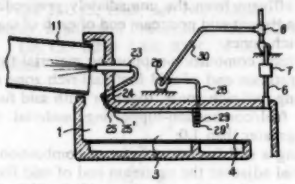
a clinker box adjacent said end of said kiln for receiving clinker produced by said kiln,

said clinker box having a ceiling thereover,

means for passing secondary air into contact with said clinker prior to passing said secondary air into said end of said kiln,

at least one heating tube group disposed adjacent to said ceiling,

said heating tube group formed with a continuous passage having one end in communication with said burner and



the other end in communication with said means for supplying said primary air to said burner whereby said primary air passes through said heating tube group in said clinker box and is preheated prior to passing into said burner.

4,500,287

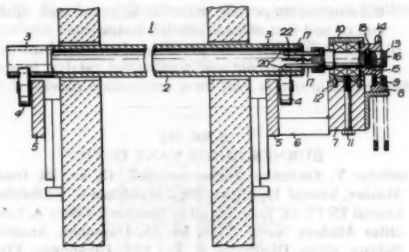
ROLLER TABLE FOR SINGLE-LAYER CERAMIC KILNS IN GENERAL

Dario Carraroli, Modena, and Giordano Giavelli, Sassuolo, both of Italy, assignors to Carfer S.r.l., Modena and Officina Meccanica Giavelli S.p.A., Reggio Emilia, both of, Italy

Filed Nov. 15, 1982, Ser. No. 441,905

Int. Cl.³ F27D *3/00*; **B65G** *13/06*

U.S. Cl. 432—246 **11 Claims**

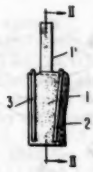


1. In a roller table for single-layer ceramic kilns of the type comprising a plurality of generally equidistant hollow metal or ceramic rollers, the opposite ends of which emerge from the respective side walls of a ceramic material firing tunnel of the kiln for rotation by a friction drive system comprising a chain, the improvement comprising outside the firing tunnel at the opposite ends of each of said rollers, a pair of spaced apart idle wheels for supporting the roller for rotation; each roller having a drive end, and at the drive end of each roller, a rotatable drive shaft generally coaxial with the roller and axially outwardly of the drive end; cooperating means between said drive shaft and said drive end for driving the roller to transfer material along the tunnel while leaving the roller free to expand axially as a result of thermal expansion, and cooperating means between said drive shaft and said drive end of the roller maintaining the roller in an operating position in the tunnel during operation of the kiln, and for permitting axial removal of the roller from the kiln by withdrawing the roller axially away from the shaft.

4,500,288
ANGULAR MOLD FOR DENTAL USE

Hans C. von Weissenfluh, Magadino, Switzerland, assignor to Hawe-Neos Dental Dr. H. v. Weissenfluh S.A., Gentilino, Switzerland

Filed Dec. 30, 1982, Ser. No. 454,851
Claims priority, application Switzerland, Jan. 21, 1982, 350/82
Int. Cl.³ A61C 9/00
U.S. Cl. 433—40 14 Claims

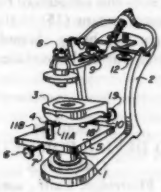


1. An angular mold for dental use comprising a cap of material transparent to ultraviolet rays and the rays of the visible solar spectrum, the cap having the shape of the lateral half of a human tooth and being open on one side and closed at its top and open at its bottom, the cap having a stem on its closed top that makes it possible to grasp the mold without blocking the passage of the rays of ultraviolet and visible light, and a permanently deformable reinforcement that extends from top to bottom of the cap and that occupies only a minor portion of the area of the cap thereby to avoid blocking said rays.

4,500,289
DENTURE OCCLUSAL MOUNTING TRANSLATOR

Ugo S. Garganese, 1790 Warwick Ave., Warwick, R.I. 02889; John R. Griffin, 5 Franconia St., Dorchester, Mass. 02122, and Raymond H. Martin, 88 Brisbon Rd., Somerset, Mass. 02726

Filed Aug. 5, 1982, Ser. No. 405,427
Int. Cl.³ A61C 11/00
U.S. Cl. 433—54 1 Claim

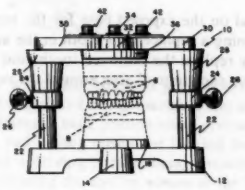


1. A dental occlusal mounting translator for use with an articulator said translator is used to mount and set a dental cast of a patients maxilla to the patients exact occlusal plane in relation to the zero-degree table, said translator having a flat zero-degree table on which artificial teeth are to be set; said zero-degree table having an anterior elevating calibrated rod capable of swivel movements with a horizontal support pin grooved on one end for supporting the anterior papilla of the maxillary cast; a pointer on the opposite end of the pin for positioning of the arch of multiple artificial teeth said pointer located at the top section of the elevating calibrated rod; a posterior horizontal support bar for engaging the hammula notches of the maxilliary cast with elevating capabilities located at the opposite side of the zero-degree table from the calibrated papilla rod; a square holed mounting disc at the base of the zero-degree table and a mounting attachment for the translator table having adjustable clamp with a set screw for tightening to the base of articulator having mounting platform with a square protrusion at the top side to fit the square holed disc of the base of the translator table to secure the attachment and table together and a mounting attachment for insertion into the square holed disc for attaching the translator table to any articulator, said mounting attachment having adjustment clamp with a set screw for tightening to the base of any articulator.

4,500,290
ARTICULATOR DEVICE AND METHOD

Jerry C. Anderson, 4567 W. Central, Suite B, Wichita, Kans. 67212

Filed Jun. 9, 1983, Ser. No. 502,762
Int. Cl.³ A61C 11/00
U.S. Cl. 433—54 3 Claims



1. An articulator device for articulating upper and lower dental casts comprising a base having a generally T-shaped structure defining a tongue-like protrusion including a longitudinal slot;

a lower dental cast holding pad for holding said lower dental cast and secured to the tongue-like protrusion and movably disposed along said longitudinal slot for anterior-posterior direction repositioning of the lower dental cast with respect to the upper dental cast for malocclusive correction;

a pair of support pins implanted in said base;

a pair of collars slideably positioned along the support pins and having means for fixedly securing the collars to the support pins;

a guide member slideably disposed along the pair of support pins and supported by the collars in order to be elevated or lowered in accordance with the movements of the collars;

a holder supported by said guide member and having a generally T-shaped structure defining a tongue-like protrusion, said holder comprising a structure defining a pair of generally elongated recessed apertures wherethrough said pair of pins slideably pass and said holder further defining a pair of elongated slots;

means for adjustably laterally moving said holder with respect to said guide member to align the upper and lower dental casts for posterior occlusion;

and an upper dental cast holding pad for holding the upper dental cast and rotatably bound to said tongue-like protrusion of said holder.

4,500,291
METHOD OF FABRICATING DENTURES

Sammy G. Davis, and Donna C. Gulling, both of 10319 E. 42nd St., Kansas City, Mo. 64133

Filed Jul. 25, 1983, Ser. No. 516,790
Int. Cl.³ A61C 13/00
U.S. Cl. 433—213 6 Claims

1. A method for fabricating denture plates, comprising the steps of:

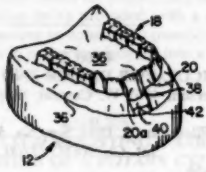
preparing an impression of the patient's arch;

casting a plaster model of the patient's arch;

forming a wax plate to the contour of the palate and gingiva of the model;

removing one of the teeth of the model to thereby expose the base of the model;

preparing the denture plate by building up a base of acrylic



material on the exposed base for the removed tooth and positioning a replacement tooth in the acrylic material to thereby replace the removed tooth; and

building up the gingival area around the replacement tooth.

4,500,292

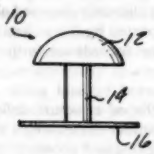
METHOD AND APPARATUS FOR PREPARING MUCOSAL TISSUE FOR THE RECEPTION OF DENTURE ANCHORING INTRAMUCOSAL INSERTS

Carl E. Misch, 1611 Monroe, Dearborn, Mich. 48124

Filed Jul. 27, 1983, Ser. No. 517,569

Int. Cl.³ A01C *8/00*

U.S. Cl. 433—173 **3 Claims**



1. A temporary insert for use in preparing a freshly formed cavity in the mucosal tissue of a patient for the reception of an intramucosal insert permanently attached to a denture, said intramucosal insert having a shaft with an enlarged head fixedly secured to and projecting from the inner surface of the denture, said temporary insert comprising:

a shaft formed with an enlarged head at one end thereof of a size and shape the same as that of the shaft and enlarged head of said intramucosal insert, said head having a dome-like face opposed to the shaft and a flat, planar face contiguous to the shaft adjoining the upper at an angle; and

a thin retainer plate fixedly secured to the other end of said shaft of said temporary insert to lie flat against the surface of mucosal tissue of a patient when the shaft and head of said temporary insert are seated within said freshly formed cavity;

the thickness of said plate being insufficient to exert any substantial interference with a normal denture seated on said mucosal tissue in unattached overlying relationship to said temporary insert when said temporary insert is seated in said cavity.

4,500,293

APPARATUS FOR CONVERTING ELECTRIC SIGNALS REPRESENTING DATA INTO A GROUP OF RAISED DOTS CONSTITUTING THE IMAGE OF SAID DATA

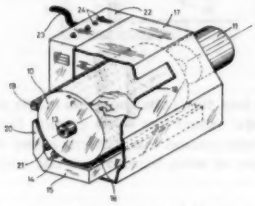
Jean J. Eltgen, Paris, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Jan. 30, 1984, Ser. No. 575,293

Claims priority, application France, Feb. 11, 1983, 83 02238

Int. Cl.³ G09B *21/02*

U.S. Cl. 434—114 **16 Claims**



1. Apparatus for converting electric signals representing data into a coded image of said data comprising a group of raised dots intended to be read by touch or recorded on a medium, said apparatus comprising a magnetic recording medium (10) having a surface capable of being magnetized locally at quasi point-shaped sites disposed in rows (L1, L2, L3) and columns (K1, K2), a recording unit (14) placed near said surface and operatively arranged to selectively magnetize said elementary sites of said medium in response to the reception of said electric signals, a drive (11) to bring about a relative displacement between said recording medium and said recording unit according to a preset direction of movement so as to enable said elementary sites to be selectively magnetized in the course of their movement past said recording unit, and an applicator means (15) downstream of said recording unit (14) in relation to said direction of movement for depositing on said recording medium (10) particles that are capable of being attracted magnetically, said magnetic recording medium (10) having a plurality of cells (12) each locally established in each of said elementary sites and adapted to receive a particle deposited by said applicator means (15) in the cells that have been magnetized, said particle being shaped so that the particles received at a site juts out at the surface of said recording medium.

4,500,294

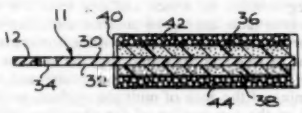
METHOD AND DEVICE FOR DETECTING DENTAL CAVITIES

William D. Lewis, Flintridge, Calif., assignor to Epic International Corporation, North Hollywood, Calif.

Filed Oct. 3, 1983, Ser. No. 538,568

Int. Cl.³ A61C *5/00*

U.S. Cl. 433—215 **16 Claims**



1. A device for detecting tooth decay comprising:

a support member having upper and lower surfaces adapted for placement in a user's mouth for concurrent engagement of said upper surface against the user's upper teeth and said lower surface against the user's lower teeth;

temperature sensing means responsive to a temperature in excess of a first threshold temperature T1 for producing a

first visible indication and responsive to a temperature in excess of a second threshold temperature T2 for producing a second visible indication, distinguishable from said first visible indication; and

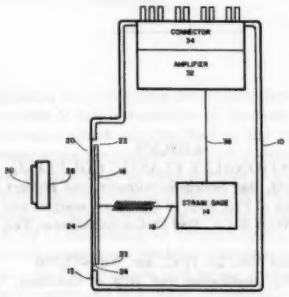
means affixing said temperature sensing means to said support member upper surface for contacting multiple ones of said user's upper teeth, said temperature sensing means exhibiting a substantially uniform response across said upper surface whereby teeth of the same temperature will cause said sensing means to produce the same visible indications.

4,500,295

PERSONAL ALPHA CONTAMINATION SIMULATOR AND DETECTOR

Richard H. Insinger, III, Tangerine, and Alfred H. Rodemann, Maitland, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1983, Ser. No. 498,337
Int. Cl.³ G09B *9/00*
U.S. Cl. 434—218 **7 Claims**



1. Apparatus useful as a portable radiation comtamination training device that simulates detection of alpha radiation on personnel and clothing by reacting to a magnet that has been purposefully placed on a personnel subject, comprising:

a housing simulating in appearance the probe of an operational alpha radiation detection device, having a portion designed to face said subject during said training;

a deformable, magnetically responsive material mounted within said housing adjacent said portion;

gage means fixedly coupled to said material for providing an electrical signal indicative of deformation in said material;

electronic means coupled to said signal for preparing said signal to be coupled to said operational alpha radiation detection device.

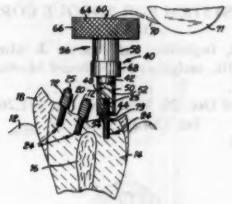
4,500,296

METHOD AND APPARATUS FOR REINFORCING DENTAL ANCHORS

Abraham Friedman, Brooklyn, N.Y., assignor to IPCO Corporation, White Plains, N.Y.

Filed Jun. 16, 1983, Ser. No. 504,936
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—225 **20 Claims**

1. In combination, a dental anchor for insertion into a channel formed in a tooth, and a dental tool coacting on the dental anchor, said dental anchor comprising an elongated body integrally including an anchoring portion for operative association within the channel and an extended portion protruding from said channel, said dental tool including means for wrapping a wire peripherally about at least a part of said extended portion of said dental anchor, said dental tool means including an elongated rod having an operating end and an opposite manipulating end, a receiving chamber provided in said rod and axially extending from said operating end for receiving said extended portion therein, a passageway provided longitudinally through said rod in an offset arrangement with said chamber for retaining a supply wire therein so that rotation of said tool helically wraps the wire about the extended portion of



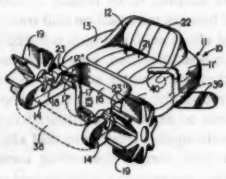
the dental anchor when said extended portion is received in said chamber, said dental tool being insertable into an automatically driven handpiece, a neck portion being provided on said manipulating end and having means for locking the tool into the handpiece, and a driving portion being provided on said tool for rotatably driving the tool by means of the handpiece.

4,500,297

PADDLE WHEEL PROPELLED WATERCRAFT

Paul Boulva, 221 Lockhart, T.M.R., Montreal, Que., Canada H3P 1Y3

Filed Sep. 30, 1982, Ser. No. 429,309
Int. Cl.³ B63H *16/00*
U.S. Cl. 440—27 **11 Claims**



1. A watercraft comprising a main flotation body, said main flotation body having a seat portion, said seat portion being formed integral with said main flotation body and a seat cavity extending substantially centrally below an upper surface of said main flotation body, said main flotation body defining a circumferential flotation casing about said seat cavity for lateral flotation stability of said body, support means for a crank axle, said support means having at least two spaced apart side booms extending forwardly of said main flotation body one to each side of said main flotation body, a front boom bridging said side booms in a forward end thereof to constitute a wave breaking means, an open area defined between said side booms and said front boom, said open area being provided with a bottom wall spaced from said crank axle to permit crank formations in said axle to be freely displaced thereabove on an axle pivot axis, a crank axle removably retained transversely across said side booms over said open area in axle retaining means, said crank formations imparting axial rotation to opposed end portions of said axle, and a floatable paddle wheel secured to each opposed end portions of said axle to propel said flotation body on a water surface, said paddle wheel being formed as a flotation body to add flotation support to said booms on said water surface, said crank axle and paddle wheels connected thereto being detachable from said booms as a unitary structure to solely support a user on said water surface and to provide for the user to propel himself by hand operation

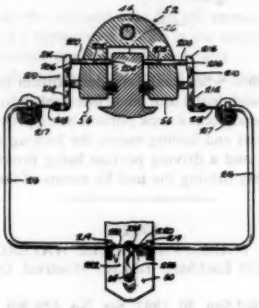
of said crank formations to impart rotation to said wheels to generate a propelling force.

4,500,298

CONTROL SYSTEM FOR TORQUE CORRECTING DEVICE

Charles B. Hall, Ingleside, and Martin J. Mondek, Wonder Lake, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 20, 1982, Ser. No. 451,268
Int. Cl.³ B63H 25/42
U.S. Cl. 440—62 1 Claim



1. A marine propulsion device comprising a propulsion unit, a transom bracket adapted to be fixedly connected to a boat transom, a swivel bracket mounted on said transom bracket for pivotal movement about an axis which is horizontal when said transom bracket is boat mounted, king pin means mounted on said swivel bracket for pivotal steering movement of said propulsion unit, means for mounting said propulsion unit on said king pin means so as to permit limited rotational movement of said propulsion unit relative to said king pin means in a horizontal direction, torque correcting means, means for mounting said torque correcting means on said propulsion unit for pivotal movement about an axis transverse to said horizontal axis, and linkage means for displacing said torque correcting means about said transverse axis in response to rotational movement of said propulsion unit relative to said king pin means, said linkage means including rod means slidably mounted in said means mounting said propulsion unit on said king pin means and means connecting said rod means to said torque correcting means for transmitting sliding movement of said rod means to adjust said torque correcting means.

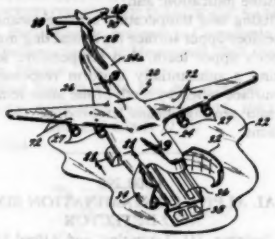
4,500,299

TOY CARGO PLANE

William J. Kelley, Torrance, and Terry K. Prince, Palos Verdes, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed May 19, 1983, Ser. No. 496,149
Int. Cl.³ A63H 27/00
U.S. Cl. 446—230 8 Claims

1. A toy cargo plane having a fuselage; a pair of front doors moveably affixed to said fuselage; means for manually opening and closing said front doors including a rod slideably carried in said fuselage, said rod having a lever fixed thereto and being formed so as to be capable of being grasped by the hand of a user for moving said rod along its axis; means attached to said rod cooperating with said front doors for moving said front doors; and further manually operated means slideably carried



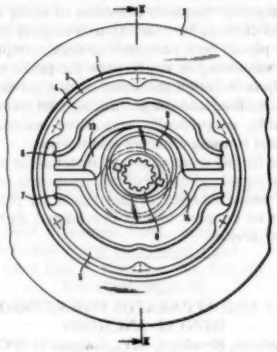
in said fuselage for moving a ramp in and out of said front doors, when said front doors are opened.

4,500,300

ROTATIONALLY ELASTIC COUPLING

Franz-Josef Wolf, Bad Soden-Salmünster, and Hubert Pletsch, Birkenau, both of Fed. Rep. of Germany, assignors to WOCO Franz-Josef Wolf & Co., Bad Soden-Salmünster, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,386
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211238
Int. Cl.³ F16D 3/68, 3/50
U.S. Cl. 464—83 22 Claims



1. A rotationally elastic coupling comprising two rotatable half coupling means, an eccentric disc means mounted on one of said half coupling means, said eccentric disc means being displaced along a translatory path of travel upon rotation of said one half coupling means, resilient means mounted on said other half coupling means, said resilient means being disposed within said translatory path of travel of said eccentric disc means such that said resilient means is compressed generally radially outwardly in resiliently resisting relative rotation between said two half coupling means, whereby said two rotatable half coupling means are thereby resiliently coupled.

4,500,301

APPARATUS FOR CONTROLLING THE TRANSMISSION RATIO OF AN INFINITELY VARIABLE TRANSMISSION

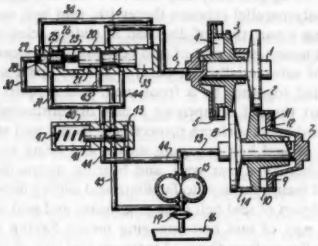
Theodorus P. M. Cadeé , Goirle, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Oct. 5, 1982, Ser. No. 432,857

Claims priority, application Netherlands, Oct. 5, 1981, 8104510

Int. Cl.³ F16H *11/04*

U.S. Cl. 474—28 **3 Claims**



1. An apparatus for controlling the transmission ratio of an infinitely variable V-belt transmission of the kind including a fluid control valve which supplies fluid to and relieves fluid from a cylinder space the volume of which controls the transmission ratio by adjusting the axial position of a first conical sheave portion relative to a second conical sheave portion, said valve including a valve housing, an internal axially displaceable valve body an electromagnet having a displaceable armature, the electromagnet upon electrical energization producing an axial force on the armature, and spring means connected between the armature and said axially displaceable valve body, the arrangement being such that the axial force on the armature produced by energization of the electromagnet produces a displacing force, via said spring means, on said valve body in one direction; and fluid connection means controlled by the position of the armature for supplying fluid pressure to said valve body to effect a displacing force thereon in a direction opposite to said one direction such that said valve body is displaced in said opposite direction to a position in which the displacing forces on said valve body are balanced.

4,500,302

DERAILLER FOR A CYCLE HAVING AN ORIENTABLE CHAIN GUIDING DEVICE

Hervé Crépin, Noyelles sur Mer, France, assignor to Huret et ses Fils, Nanterre, France

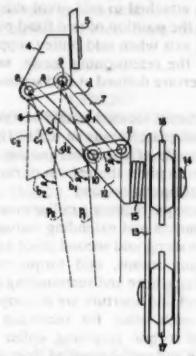
Filed Oct. 5, 1983, Ser. No. 539,176

Claims priority, application France, Oct. 12, 1982, 82 17081

Int. Cl.³ F16H *7/22*

U.S. Cl. 474—82 **5 Claims**

1. A derailleur for a cycle having free-wheel sprockets, the derailleur comprising a fixed support, a chain guiding device, a deformable articulation structure pivotally connecting the chain guiding device to the support and for connection to a control cable for positioning the chain guiding device relative to the free-wheel sprockets, the deformable articulation structure comprising a deformable quadrilateral structure having at least two sides which are of unequal lengths.



4,500,303

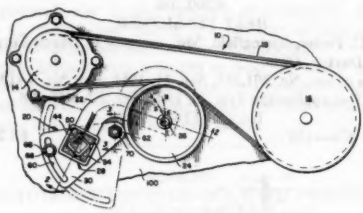
IDLER MECHANISM

DeWayne T. Sermersheim, and Jack L. Baxter, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 31, 1981, Ser. No. 336,333

Int. Cl.³ F16H *7/10, 7/12*

U.S. Cl. 474—112 **14 Claims**



1. An idler mechanism for establishing and maintaining tension in a drive belt having a length which may be within a known tolerance range, with the belt being used in a belt drive system which includes at least one driving pulley and one driven pulley operatively interconnected by the drive belt, comprising:

(a) pulley means having a pulley rotation axis;

(b) pulley supporting means operating in both a retensioning mode and a fixed pivot axis mode for biasing said pulley means against the belt in response to application of a known belt tensioning force when said pulley supporting means is operating in a retension mode, by causing the pulley rotational axis to reside at a point along a predetermined retensioning arc which has no single fixed radius of curvature, said point being dependent upon the length of the belt within the known tolerance range and for continuing to apply a tensioning force to the belt when said pulley supporting means is operating in a fixed pivot axis mode by causir.g the pulley rotational axis to move along a second arcuate curve centered around a fixed axis, said pulley supporting means including

(1) an idler arm supporting said pulley means;

(2) resilient means for applying a biasing force to said idler arm;

(3) pivot axis forming means supporting said idler arm for

rotation about the fixed pivot axis defined by said pulley supporting means when operating in the fixed pivot axis mode; and

(4) plate means attached to said pivot axis forming means for adjusting the position of said fixed pivot axis about a second pivot axis when said pulley supporting means is operating in the retensioning mode, said plate means having an aperture defined at said second pivot axis and including

(i) fastening means located at said second pivot axis for holding said plate means in a fixed position during said fixed mode of operation and for permitting said plate means to pivot thereabout during the retensioning mode of operation, and

(ii) a tubular torque receiving collar means integral with said plate means and extending outwardly from said plate means along said second pivot axis for receiving said fastening means, said torque receiving collar means having a bore and surrounding said aperture so said bore and said aperture are in cooperative association with each other for receiving said fastening means, said torque receiving collar means further including an end surface spaced from said plate means for engaging said fastening means to prevent said plate means from rotating about said second pivot axis during said fixed pivot axis mode of operation and for being spaced apart from said fastening means during said retensioning mode of operation, said torque receiving collar means further including a planar surface thereon which extends between said end surface and said plate means and which is adapted to be grasped by a torque tool, such as a standard torque wrench for imposing the known force about said second pivot axis during the retensioning mode of operation.

4,500,304

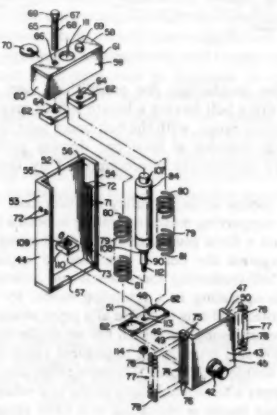
BELT TENSIONER

Randy C. Foster, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 301,351, Sep. 11, 1981, Pat. No. 4,413,982. This application Feb. 23, 1983, Ser. No. 468,918

Int. Cl.³ F16H 7/12

U.S. Cl. 474—138 **4 Claims**



1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and fluid dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means in at least one direction of movement thereof, said fluid dampening means comprising a piston and cylinder means having a piston member and a cylinder member, the improvement wherein said mechanical spring means comprises a pair of coiled compression springs with their longitudinal axes disposed in substantially parallel side-by-side spaced relation, said fluid dampening means being generally disposed between said springs and in substantially parallel relation therewith, said belt engaging means having a part thereof disposed in sliding relation with said support means, said part of said belt engaging means having a pair of substantially flat parallel spaced apart surfaces interconnected together by a front wall, said support means having a part thereof comprising a pair of substantially flat parallel spaced apart surfaces respectively facing said surfaces of said part of said belt engaging means and being interconnected together by a rear wall, and bearing means disposed between said facing surfaces to facilitate said sliding movement between said part of said belt engaging means and said support means, said part of said belt engaging means having a third substantially flat surface disposed between said pair of surfaces thereof and being substantially transverse relative thereto, said springs and said piston member of said fluid dampening means being respectively operatively interconnected to said third surface of said belt engaging means, said part of said support means having a third substantially flat surface disposed between said pair of surfaces thereof and being substantially transverse thereto and being between said pair of springs, said cylinder member of said fluid dampening means being operatively interconnected to said third surface of said support means.

4,500,305

SIDE-BAR CHAIN FOR INFINITELY VARIABLE CONE PULLEY TRANSMISSIONS

Manfred Rattunde, Bad Homburg, Fed. Rep. of Germany, assignor to P.I.V. Antrieb Werner Reimers GmbH & Co. KG, Bad Homburg, Fed. Rep. of Germany

Filed Jul. 28, 1982, Ser. No. 402,557

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1981, 3129631

Int. Cl.³ F16G 1/00

U.S. Cl. 474—201 **4 Claims**

1. In a side-bar chain for an infinitely variable cone pulley transmission; said chain having a running direction and including links composed of individual side bars and single-part rocker pieces inserted through apertures in the side bars and connecting the links together, the rocker pieces having a length transverse to said running direction and end faces extending parallel to said running direction for directly frictionally engaging friction pulley sheaves and for transmitting friction forces between associated friction pulley sheaves and the side-bar chain, the improvement wherein:

each of said side bars has first and second end webs spaced apart parallel to said running direction, said first and

second end webs extending transverse to the running direction and to the length of the rocker pieces, said first end web having a first edge and said second web having a second edge; said first and second edges extending generally transversely to the running direction and to the length of the rocker pieces and bounding a side-bar aperture: said side-bar aperture being traversed by a first rocker piece adjoining said first edge and a second rocker piece adjoining said second edge; said first and second edges having a convex rocker surface projecting into the side-bar aperture; the convex rocker surfaces having a first radius of curvature;

each of said first and second rocker pieces have opposite concave rocker surfaces extending parallel to the length of the respective rocker piece; said concave rocker surfces having a second radius of curvature;

said first radius of curvature of each said convex rocker surface is smaller than said second radius of curvature of each said concave rocker surface;

the concave rocker surfaces of each said rocker piece are in rolling engagement with respective adjoining convex rocker surfaces of said first and second webs;

each rocker piece traverses the respective side bar apertures with a clearance in both directions transverse to the running direction and to the length of the rocker piece; and

said rocker pieces being normally contacted by the side bars solely with said rolling engagement.

4,500,306

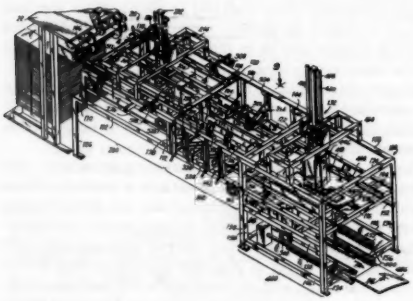
METHOD AND APPARATUS FOR ERECTING A CARTON WITH INTEGRAL INTERIOR PARTITIONS

Ulrich G. Nowacki, Leisure City, Fla., assignor to International Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 393,493, Jun. 29, 1982, abandoned. This application Jun. 21, 1983, Ser. No. 504,529

Int. Cl.³ B31B *11/26*

U.S. Cl. 493—92 **28 Claims**



1. A method for manufacturing from a single carton blank a rectangular carton with integral interior partitions, each carton blank having a bottom wall, two end walls and two side portions, each side portion having a side wall, an upper-right flap portion, a lower-right flap portion, an upper-left flap portion, and a lower-left flap portion, the steps in sequence comprising:

feeding the carton blank into an apparatus for erecting the carton into a box;

bending the flap portions of the carton blank perpendicular to the side walls of the carton blank;

applying adhesive to the flap portions;

folding and sealing the side portions to form two open-ended rectangular tubes;

applying adhesive to the open-ended rectangular tubes;

raising the open-ended rectangular tubes to a position perpendicular to the bottom wall of the carton blank;

forcing the end walls of the carton blank to bend perpendicular to the bottom wall of the carton blank;

sealing the open-ended rectangular tubes to the end walls to form the completed carton; and

ejecting the completed carton from the carton erecting apparatus.

4,500,307

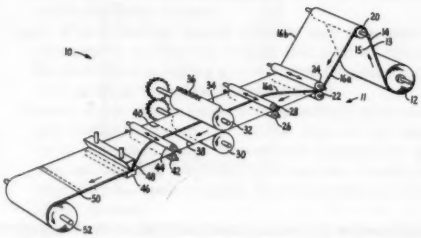
APPARATUS FOR PRODUCING CONTINUOUS BAGS OF THIN WALL MATERIAL

Danial N. P. Bridgeman, 12650 Skyline Blvd., Woodside, Calif. 94062

Filed Oct. 23, 1981, Ser. No. 314,205

Int. Cl.³ B31B *1/64*

U.S. Cl. 493—196 **6 Claims**



1. An apparatus for the production of continuous bags of thin material with each of said bags having an opening on a side, wherein said apparatus having reel means for supplying a continuous length of advancing thin tubing advancing in the direction of production, said tubing having a width substantially perpendicular to said direction of production, sealing means for sealing said tubing in a plurality of first spaced locations, wherein said improvement comprising:

a single blade having a length at least the width of said tubing; said blade adapted to cut through substantially one half the width of said tubing, and to perforate through the other half of the width of said tubing.

4,500,308

AUTOTRANSFUSION DEVICE WITH TWISTED COLLECTION BAG

Leonard D. Kurtz, Woodmere, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Filed Nov. 16, 1982, Ser. No. 441,991

Int. Cl.³ A61M *1/03*

U.S. Cl. 604—4 **14 Claims**

1. An autotransfusion device for collecting blood from a pool in a patient and for subsequently returning the collected blood to the circulatory system of the patient comprising:

a rigid cylindrical housing having an end wall and a side wall;

a movable piston located in said housing;

a generally cylindrical, deformable collection bag located in said housing, the peripheral ends of said collection bag being attached, respectively, adjacent the periphery of said end wall and the periphery of said piston such that a collection chamber is formed between said end wall, said piston and said collection bag;

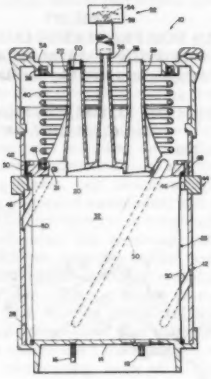
aspirator means for connecting said collection chamber to a source of suction and to the pool of blood;

outlet means for connecting said collection chamber to the circulatory system of the patient;

resiliency means located in said housing for resiliently urging said piston towards said end wall and collapsing said collection bag;

locking means for releasably locking said piston spaced from

said end wall during collection of the blood from the pool such that after said collection bag is adequately filled, said locking means is released to force the collected blood from said collapsing collection bag to the circulatory system of the patient as said piston is urged by said resiliency means toward said end wall; and



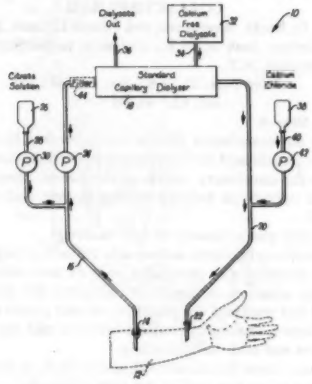
guide means for rotating said piston about the longitudinal axis of said housing as said piston moves toward said end wall such that said collection bag is correspondingly twisted as said collection bag is collapsed so that said collection bag is prevented from becoming inadvertently trapped between said side wall and said piston.

4,500,309

METHOD FOR REGIONAL ANTICOAGULATION DURING EXTRACORPOREAL DIALYSIS

Dennis A. Diederich, Overland Park; Thomas B. Wiegmann, Fairway, and Robert V. Pinnick, Overland Park, all of Kans., assignors to The Kansas University Endowment Association, Lawrence, Kans.

Filed May 7, 1982, Ser. No. 375,890
Int. Cl.³ A61M *1/03*
U.S. Cl. 604—5 **12 Claims**



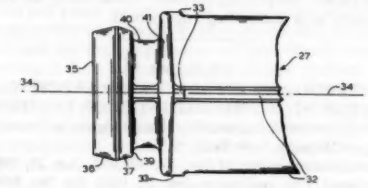
1. A blood treatment method comprising the steps of:
withdrawing blood from a patient at a rate of from about 100 to 300 milliliters per minute;
preventing the coagulation of said withdrawn blood by infusing an anticoagulant substance into the blood, said anticoagulant substance consisting essentially of citrate anion and being infused at a level to provide up to about 10 millimoles of citrate anion per liter of blood;
passing the withdrawn, citrate-infused blood through treatment apparatus concurrently with a toxin-removing dialysate for removing toxins from the blood;
after passage of said blood through said apparatus, infusing into said blood a calcium compound in an amount to achieve a desired level of calcium ion in said blood; and
returning the calcium-infused blood to said patient.

4,500,310

VARIABLE SEALING PRESSURE PLUNGER ROD ASSEMBLY

Werner Christinger, Franklin Lakes, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Dec. 20, 1982, Ser. No. 451,307
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—228 **27 Claims**

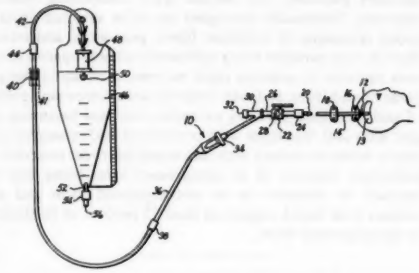


1. A plunger rod assembly for use with a syringe barrel having a cylindrical inside wall and provided with a proximal open end to receive the plunger rod assembly and a distal end adapted to receive and be in fluid communication with fluid delivery means comprising:
a plunger rod including a rigid elongate shaft portion having a circular tapered tip portion at the distal end thereof, said shaft portion being sufficiently long as to be accessible outside of the syringe barrel;
a flexible thermoplastic stopper including an annular side wall circumscribing a longitudinal axis, a continuous front wall intersecting said longitudinal axis and being integral with said side wall, an annular rib being larger in diameter than said side wall and being integral with said side wall, said rib being larger in diameter than the syringe barrel cylindrical inside wall, an inside surface of said front wall, a tapered annular inside wall extending from said inside surface and being integral with said side wall, said tapered annular inside wall and said inside surface defining a cavity which has said tapered tip portion received therein, said tapered annular inside wall having a substantially continuous smooth surface, said tapered annular inside wall being inclined at approximately the same angle as said tapered tip portion and adjacent thereto whereby force applied to said shaft portion in the direction of descending taper of said tapered tip portion creates a force component which is directed substantially outwardly from the interface of said tapered tip portion and said tapered annular inside wall wherein said rib applied more pressure to the syringe barrel cylindrical wall than the initial pressure existing as a result of said rib being larger than the syringe barrel inside wall; and
cooperating means for maintaining the positional relationship of said stopper and said plunger rod.

4,500,311
EXTERNAL VENTRICULAR DRAINAGE ASSEMBLY

Russell J. Redmond, and Jessica B. Ash, both of Santa Barbara, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 23, 1983, Ser. No. 469,060
Int. Cl.³ A61M 5/00
U.S. Cl. 604—246 **22 Claims**

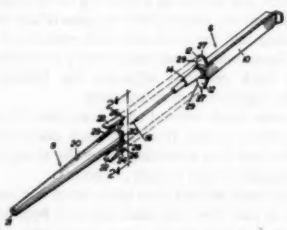


1. An external ventricular drainage assembly comprising:
(a) a ventricular drainage catheter for placement in the ventricles of a patient's brain for receiving cerebrospinal fluid;
(b) retention means connected to the catheter for securing the catheter to the patient and for preventing relative movement between the catheter and patient;
(c) valve means connected to the catheter for selectively opening and closing the external ventricular drainage assembly to fluid flow;
(d) an adapter means connected to the valve means for providing access to the fluid flow path of the assembly;
(e) a one-way valve connected to the adapter means;
(f) a first length of flexible tubing connected to the one-way valve;
(g) coupling means having a first member connected to the first length of flexible tubing and a second member connected to a second length of flexible tubing, which first and second members interconnect to connect the first and second lengths of flexible tubing; and
(h) a collection reservoir for collecting cerebrospinal fluid, having an entry port which is connected to the second length of flexible tubing through a drip chamber and having an outlet port from which collected cerebrospinal fluid can be removed.

4,500,312
CONNECTING ASSEMBLY

Richard H. McFarlane, 2571 Kaneville Rd., Geneva, Ill. 60134

Filed Dec. 15, 1982, Ser. No. 450,025
Int. Cl.³ A61M 5/00
U.S. Cl. 604—263 **5 Claims**

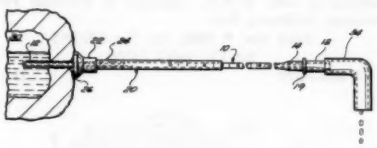


1. A connecting assembly used in combination with a catheter means and mounted at least in part on said catheter means and on a sheath element positionable in covering relation to a portion of said catheter means, said connecting assembly comprising:
(a) flange means including two flange elements mounted on said catheter means and each extending outwardly therefrom in an opposite direction to one another and substantially transversely to a longitudinal axis of said catheter means,
(b) a locking assembly including two locking fingers mounted on said sheath element in spaced apart relation and each disposed for engagement with one of said flange elements,
(c) two link elements integrally formed on said sheath element and each attached in interconnecting relation between said sheath element and one of said locking fingers, each of said locking fingers pivotal about said link element into and out of attached relation with the respectively positioned flange element,
each of said locking fingers disposed and structured for substantially overlapping engagement with a respective flange element including groove means integrally formed in an undersurface of each locking finger,
(e) each of said groove means correspondingly dimensioned and configured relative to a distal edge of said respectively positioned flange element and disposed for selective, substantially surrounding reception of said distal edge therein, upon selective pivotal movement of said flange element,
(f) guide means mounted on and extending outwardly from said sheath element in substantially parallel relation to a leading end of each locking finger, said guide means comprising two pairs of projections, each pair adjacent to one of said locking fingers and each projection thereof spaced apart a sufficient distance to border oppositely disposed lateral peripheral edges of each flange element adjacent said distal edge thereof,
(g) each of said locking fingers and one respectively positioned pair of projection collectively disposed in surrounding engagement with a peripheral portion of one of said flange elements, whereby each flange element and said catheter means attached thereto being mounted in fixed, attached position relation to said sheath element upon connection of the flange means with said locking fingers and said guide means.

4,500,313
URETHRAL CATHETER

David E. Young, Watlington, England, assignor to Protectair Limited, Watlington, England

Filed Jan. 27, 1983, Ser. No. 461,564
Int. Cl.³ A61B 5/10
U.S. Cl. 604—280 **7 Claims**

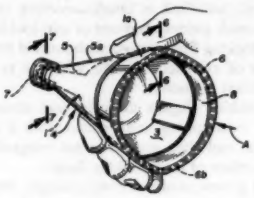


1. A catheter comprising an inner tubular member having an end portion with an opening, said end portion being adapted to be received in the urethra and an outer sleeve member into which said inner tubular member is freely movably received, said outer sleeve member having an enlarged end adapted to be situated adjacent the external urethral meatus, said inner tubular member comprising a section comprising calibration markings thereon, said calibration section being spaced from said opening in said end portion a distance substantially equal to the length of said outer tubular membe.:

4,500,314
COLLAPSIBLE URINAL DROP COLLECTOR APPLICATOR

Lennart I. Brendling, Volmvägen 10, S-175 43 Järfälla, Sweden

PCT No. PCT/SE81/00174, § 371 Date Jan. 21, 1982, § 102(e) Date Jan. 21, 1982, PCT Pub. No. WO81/03609, PCT Pub. Date Dec. 24, 1981
PCT Filed Jun. 10, 1981, Ser. No. 346,032
Claims priority, application Sweden, Jun. 11, 1980, 8004355; Jun. 11, 1980, 8004356
Int. Cl.³ A61F 5/44
U.S. Cl. 604—346 2 Claims



1. A device for facilitating the connection of a urinal drop collector to a penis comprising:

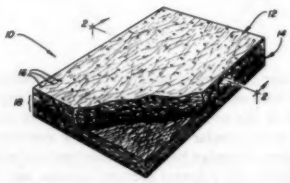
(a) a normally flat tubular casing having inner and outer surfaces and being comprised of a pair of opposed, flexible, substantially identical, generally triangular walls, each of which has a pair of side edges juxtapositioned to the corresponding side edges of the other and flexibly connected thereto and having a relatively large open upper end portion and a relatively small open tubular lower end portion; and

(b) an open-ended elastic tubular envelope removably connected to said casing and extending therethrough throughout the length thereof, said envelope having one end portion thereof stretched outwardly over and around the exterior of said lower end portion of said casing and having its opposite end portion stretched outwardly over and around said upper end portion of said casing, each in air-tight sealing relation and thereby sealing the area between said casing and said envelope in air-tight relation, whereby upon said pairs of side edges of said casing being pressed toward each other, said upper end portion of said casing will assume a conical shape and said envelope will expand and extend in close-fitting relation along the inner surface of said casing along a substantial portion of the entire length of said envelope.

4,500,315
SUPERTHIN ABSORBENT PRODUCT

Heinz A. Pieniak, North Brunswick, and Michael J. Iskra, Flemington, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Nov. 8, 1982, Ser. No. 439,963
Int. Cl.³ A61F 13/00
U.S. Cl. 604—379 21 Claims

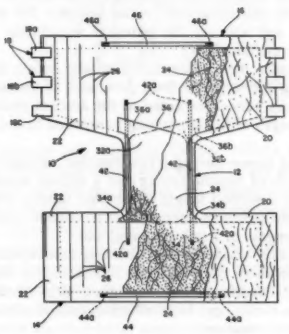


1. A disposable absorbent compressed composite laminate comprising a first layer, a second layer, and a transition area integrally and intimately connecting said first and second layers and being substantially coextensive therewith, said first layer comprising a fibrous web having a dry bulk recovery of at least about 60 percent, an initial dry bulk of at least about 20 cc/gm, and a weight less than about 2 oz/yd², and a plurality of particles or globules of superabsorbent material disposed randomly and intermittently throughout said first layer, said particles or globules being of a size and spacing whereby said particles do not interfere with the absorption of liquid by adjacent particles, said second layer comprising randomly disposed, frictionally entangled particles selected from the group consisting of cellulosic fibers, peat moss, and mixtures thereof, said particles being sufficiently closely spaced to adjacent particles to promote rapid movement of liquid along the plane of said layer, and said transition area comprising portions of said entangled particles extending into and becoming integral with said first layer with portions of said entangled particles in intimate contact with said superabsorbent material, said composite laminate in its compressed form being less than one-half its thickness in an uncompressed form and upon contact with liquid, regains at least 75 percent of its thickness in uncompressed form.

4,500,316
DISPOSABLE GARMENT

Joyce A. Damico, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 1, 1983, Ser. No. 500,120
Int. Cl.³ A61F 13/16
U.S. Cl. 604—389 20 Claims



1. In a disposable garment having a fluid pervious inner sheet, a fluid impervious outer sheet and a batt of absorbent material therebetween and having a generally hour-glass shape with a narrow crotch portion integral to oppositely disposed front and back body-encircling portions, at least one of the latter having garment securement means attached to the side edges thereof, and including elastic leg bands disposed longitudinally adjacent the longitudinal margins of the crotch portion and extending into the front and back portions of the garment and with elastic waist bands transversely extending across said front and back portions adjacent the latitudinal margins thereof, the improvement comprising:

elastic waist bands affixed to at least one of said inner and outer sheets in said front and back portions outboard of longitudinal lines extending generally along the longitudinal margins of said crotch portion,

elastic leg bands affixed to at least one of said inner and outer sheets in said front and back portions between the crotch portion and said elastic waist bands and inboard of the anchored ends of the later,

said elastic leg bands exerting a longitudinal contracting and convoluting force in the crotch portion of the garment,

said elastic waist bands exerting a transverse contracting and

convoluting force adjacent the latitudinal margins of said front and back body-encircling portions,

and the contraction of said elastic leg bands and waist bands interacting to form generally truncated triangular front and back pocket portions having one or more large longitudinally angled convolutions forming the legs of said triangles and with the bases of said triangular portions located generally along the margins of said contracted and convoluted crotch portion of the garment.

4,500,317

METHOD OF AND APPARATUS FOR PRODUCING AN ORCHESTRA EFFECT

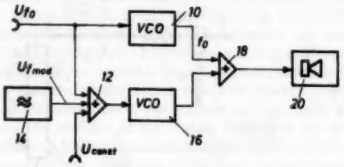
Christian J. Deforeit, Semur-en-Auxois, France, assignor to Matth. Hohner AG, Trossingen, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,531

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246418

Int. Cl.³ G10H *1/043*

U.S. Cl. 84—1.24 2 Claims



1. A method for producing a signal which, when applied to a sound transducer, will produce a complex tone commensurate with the effect of different plural sources simultaneously generating the same note, said method comprising the steps of:

producing a first control signal commensurate with a desired frequency;

producing a first audio frequency signal commensurate with said first control signal;

producing a signal which varies at a sub-audio frequency;

producing a second control signal commensurate with a preselected difference between the frequency of said first audio frequency signal and the mean frequency of a second audio frequency signal which varies in frequency;

summing said first control signal, said sub-audio frequency signal and said second control signal to produce a third control signal;

producing said second audio frequency signal in response to said third control signal, said second audio frequency signal varying in frequency over a range which is a function of the peak-to-peak amplitude of the sub-audio frequency signal about a frequency which is commensurate with the algebraic sum of said first and second control signals; and

summing said first and second audio frequency signals to produce a complex waveform.

4,500,318

METHOD FOR DESIZING, SCOURING AND BLEACHING TEXTILE PRODUCT

Yoshikazu Sando; Eiichi Nakano, and Hiroshi Ishidoshiro, all of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1983, Ser. No. 521,709

Claims priority, application Japan, Aug. 10, 1982, 57-138795

Int. Cl.³ D06L *3/02, 3/04, 1/06;* D01C *3/02*

U.S. Cl. 8—111 3 Claims

1. A method for desizing, scouring and bleaching a textile product, which comprises soaking a natural cellulose-type textile product with a neutral aqueous hydrogen peroxide solution, steaming the soaked product in a saturated water vapor atmosphere at 120° to 160° C., soaking the steamed product immediately with a hot caustic soda solution in a saturated water vapor atmosphere at 120° to 160° C. and steaming the soaked product again in a saturated water vapor atmosphere at 120° to 160° C.

4,500,319

TEXTURED PILE FABRICS

Frank E. Ehrenfeld, Jr., Morrisville, Pa., assignor to Congoleum Corporation

Continuation of Ser. No. 15,297, Feb. 26, 1979, Pat. No. 4,340,381, which is a continuation-in-part of Ser. No. 616,307, Sep. 24, 1975, abandoned, which is a continuation of Ser. No. 492,011, Jul. 26, 1974, abandoned, which is a continuation of Ser. No. 267,227, Jun. 28, 1972, abandoned, which is a continuation of Ser. No. 64,475, Aug. 17, 1970, abandoned. This application Apr. 9, 1982, Ser. No. 367,211

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.³ D06M *3/30*

U.S. Cl. 8—114.5 28 Claims

1. A process for producing an embossed effect on synthetic nylon pile fabric that comprises applying to at least certain of the upstanding nylon fibers incorporated in the pile of said fabric, a composition comprising a halogenated acetic acid in a concentration of at least about 25 percent by weight, and subjecting at least said fibers to an elevated temperature for a period sufficient to effect linear contraction thereof.

4,500,320

USE OF FINE-PARTICULATE ALKALI METAL ALUMINO-SILICATES IN THE PROCESS OF DYE SOAPING

Heinz Grunert, Dusseldorf; Fritz Hahn, Leichlingen; Ulrich Rall, Langenfeld; Klaus Schumann, Erkrath; Milan J. Schwuger, Haan, and Heinz G. Smolka, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 102,787, Dec. 12, 1979, abandoned, which is a continuation of Ser. No. 903,598, May 8, 1978, abandoned. This application Feb. 24, 1983, Ser. No. 469,420

Claims priority, application Austria, May 13, 1977, 3444/77

Int. Cl.³ B08B *3/00;* D06P *5/02*

U.S. Cl. 8—442 14 Claims

1. In the process of dyeing or printing textile materials comprising subjecting textile material to the action of aqueous dye solutions or suspensions at elevated temperatures, followed by soaping with soaping agents and recovery of the dyed or printed textile materials, the improvement consisting essentially of employing a fine-particulate, water-insoluble alkali metal aluminosilicate, containing bound water, of the formula

$$(M_2O)_x.Al_2O_3.(SiO_2)_y$$

wherein M represents an alkali metal, x is a number from 0.7 to 1.5 and y is a number from 0.8 to 6, said aluminosilicate having an average particle size in the range of from 0.1 to 25μ and a calcium binding power of from 20 to 200 mg CaO/gm of anhydrous active substance measured at 22° C. according to the Calcium Binding Power Test Method, as the sole soaping agent in the absence of polyphosphonates and surfactants.

4,500,321

PROCESS FOR THE PREPARATION OF CONCENTRATED FLUID DYE COMPOSITIONS

Paul Hugelshofer, Muttenz; Beat Bruttel, Böckten; Heinz Pfenninger, Lupsingen, all of Switzerland, and Roger Lacroix, Village-Neuf, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 268,812, Jun. 1, 1981, abandoned. This application Feb. 22, 1983, Ser. No. 468,630

Claims priority, application Switzerland, Jun. 4, 1980, 4334/80; Jul. 11, 1980, 5351/80; Mar. 6, 1981, 1527/81

The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.

Int. Cl.³ C09B *67/26, 67/10*

U.S. Cl. 8—527 38 Claims

1. A process for the preparation of storage-stable concen-

trated fluid dye compositions of water-soluble dyes, wherein an aqueous solution or suspension which, contains 10 to 60% by weight of at least one anionic crude dye is passed over an asymmetrical semi-permeable membrane containing ionic groups and having a pore diameter of 1 to 500 Å, to remove salts and synthesis by-products of molecular weights less than 500 and to partially remove water, and mixed with 15 to 85% by weight of a water-miscible organic solvent and, before or after or both before and after passage over the semi-permeable membrane.

4,500,322

APPARATUS FOR REGULATION OF GAS FEED FOR GAS CONSUMPTION

Bert S. Wikholm, Tulline, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

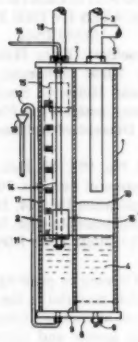
PCT No. PCT/SE82/00041, § 371 Date Sep. 28, 1982, § 102(e) Date Sep. 28, 1982, PCT Pub. No. WO82/02782, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 11, 1982, Ser. No. 432,903

Claims priority, application Sweden, Feb. 11, 1981, 8100938

Int. Cl.³ F17D *3/00*; G05D *16/00*; G01L *7/22*

U.S. Cl. 48—191 **4 Claims**



1. An apparatus for regulation of gas feed for gas consumption from a source with a variable gas production, which comprises means forming first and second chambers communicating with each other at their lower ends, at least one of the chambers being closed at its upper end, a liquid filling the lower parts of said chambers, the first chamber having an inlet for supplying gas from said source, said first chamber also having a gas outlet separate and distinct from the gas inlet for delivering gas to a gas consumer, and control means located in said second chamber and including contact means in a high position operable to start the gas consumer in response to a high liquid level in said second chamber and contact means in a low position operable to shut off the gas consumer in response to a low liquid level in the second chamber.

3. An apparatus for regulation of gas feed for gas consumption from a source with a variable gas production, which comprises means forming first and second chambers communicating with each other at their lower ends, at least one of the chambers being closed at its upper end, a liquid filling the lower parts of said chambers, the first chamber having an inlet for supplying gas from said source, said first chamber also having a gas outlet separate and distinct from the gas inlet for delivering gas to a gas consumer, control means located in said second chamber operable to start the gas consumer in response to a high liquid level in said second chamber and to shut off the gas consumer in response to a low liquid level in the second chamber, and means forming a weir outlet located outside said chambers and communicating with their lower parts, said weir outlet being on the same level as said high liquid level.

4,500,323

PROCESS FOR THE GASIFICATION OF RAW CARBONIFEROUS MATERIALS

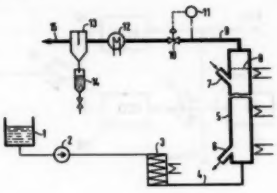
Peter Siegfried, Uttenreuth, and Martin Wenger, Ingolstadt, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 402,850

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133723; Aug. 26, 1981, 3133670

Int. Cl.³ C10J *3/00*

U.S. Cl. 48—197 R **13 Claims**



1. A process for gasification of a liquid or solid carbon-containing material which comprises maintaining a body of water in the liquid phase in a reaction zone, said liquid body of water containing a catalyst consisting of a water-soluble salt catalytically active to accelerate the gasification of the carbon-containing material to carbon monoxide and hydrogen, dissolved ionogenically in the body of water, maintaining the body of water at a reaction temperature for gasification of the carbon-containing material and sufficient pressure to retain the body of water in the liquid phase, the reaction temperature in the reaction zone is below the melting temperature of the catalytically active salt at the pressure prevailing in the reaction zone and the reaction temperature is above the critical temperature of pure H_2O, introducing the carbon-containing material into the body of water, said body of water being in the liquid phase and having ionogenically dissolved therein the catalytically active salt to accelerate the gasification to convert at least part of the carbon of the carbon-containing material to gaseous products leaving an unconverted residue, releasing the gaseous products together with some water in vapor form from the reaction zone, discharging the residue from the reaction zone, introducing make-up water and catalyst into the body of water, and introducing additional carbon-containing material into the body of water in the liquid phase containing ionogenically dissolved catalyst salt for further conversion into gaseous products.

4,500,324

METHOD OF REDUCING THE NICKEL CONTENT IN WASTE WATER

Dinh-Cuong Vuong, Port Arthur, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 27, 1983, Ser. No. 507,866

Int. Cl.³ C02F *1/54*

U.S. Cl. 48—197 R **27 Claims**

18. In the process for the production of hot raw synthesis gas, reducing gas, or fuel gas by the partial oxidation of a nickel containing liquid hydrocarbonaceous fuel with a free-oxygen containing gas and optionally with a supplemental temperature moderator, quench cooling and/or scrubbing said hot raw gas streams with water in a quench cooling and/or scrubbing zone, processing the quench and scrubbing water and recovering a dilute stream of grey water from a decanter that substantially comprises water and including at least one of the following water soluble and/or insoluble impurities: nickel and nickel compounds, metals and the sulfides of the metals V and/or Fe, particulate carbon, soot, cyanide, formates, halides, and ammonia: the improved process for reducing the content of soluble and insoluble nickel from the grey water along with at least a portion of the other soluble and insoluble impurities compris-

ing: (1) mixing said grey water with or without degassing and at a temperature in the range of about 60° to 220° F. with the following: (a) a water soluble material selected from the group consisting of HCHO, alkali metal polysulfide or ammonium polysulfide, and H_2O_2; (b) dimethyl glyoxime; (c) ferrous sulfate or ferrous chloride, and (d) a base material so as to adjust the pH of the grey water mixture to a desired value in the range of over 7 to 11; wherein a sufficient amount of the material from (a) is mixed with the waste water so that substantially all of the nickel in the soluble nickel compounds in the waste water is converted to a form which can be precipitated by the dimethyl glyoxime from (b); (2) precipitating out from the grey water mixture in (1) the following water insoluble materials: nickel-dimethyl glyoxime complex, an inorganic CN-containing sludge, iron hydroxide, and iron sulfide; and (3) separating the water insoluble materials precipitated in (2) and at least a portion of the water insoluble matter comprising nickel and its compounds, particulate carbon, soot, and the metals and the sulfides of the metals V and/or Fe from the water stream in at least one conventional solids-liquid separation means to produce a stream of clarified water having a total nickel content of less than 1 milligram per liter.

4,500,325

ABRASIVE ARTICLE

Johann Huber, Kramsach, and Otto Thanner, Schwaz, both of Austria, assignors to Tyrolit Schleifmittelworke Swarovski K.G., Austria

Filed Jul. 15, 1982, Ser. No. 398,595
Claims priority, application Austria, Jul. 20, 1981, 3189/81
Int. Cl.³ B24D *3/34*
U.S. Cl. 51—298 **1 Claim**

1. An abrasive article comprising abrasive grain, a binder agent, and fillers, at least part of the fillers being active fillers and including metal halogenides, the active fillers being chosen from the group consisting of:

$(NH_4)_2MnCl_4.2H_2O$,
$(NH_4)_6MnCl_8.2H_2O$, $KMnCl_3$, K_4MnCl_6, K_2MnCl_4,
$K_3Mn_2Cl_7$, $K_2MnCl_4.2KCl$, $KMnCl_3.2H_2O$,
$K_2MnCl_4.2H_2O$,
$K_2SnCl_4.(NH_4)_2SnCl_4$,
K_2MnCl_4,
$K_2MnCl_4.KCl$,
$K_2MnCl_4.2KCl$,
$K_2MnCl_4.3KCl$,
K_2ZnCl_4,
$K_2ZnCl_4.KCl$,
K_2ZnCl_42KCl,
$K_2ZnCl_4.3KCl$,
Na_2MnCl_4,
$Na_2MnCl_4.KCl$,
$Na_2MnCl_4.2KCl$,
$Na_2MnCl_4.3KCl$,
Na_2ZnCl_4,
$Na_2ZnCl_4.KCl$,
$Na_2ZnCl_4.2KCl$,
$Na_2ZnCl_4.3KCl$,
$K_2MnCl_3F.2KCl$,
$K_2ZnCl_3F.2KCl$,
$Na_2MnCl_3F.2KCl$ and
$Na_2ZnCl_3F.2KCl$.

4,500,326

METHOD FOR SEQUENTIALLY CLEANING FILTER ELEMENTS IN A MULTIPLE CHAMBER FABRIC FILTER

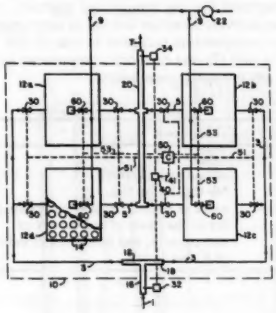
Thomas C. Sunter, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,410
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—21 **5 Claims**

1. In a method of filtering particulate matter from a particulate matter-laden gas stream wherein the particulate matter-laden gas stream is passed through a fabric filter collection apparatus comprised of a plurality of independent, isolatable filter chambers, each filter chamber housing fabric filter means upon which a portion of the particulate matter deposits, the particulate matter-laden gas stream being subdivided upstream of the collection apparatus into a like plurality of substreams each of which is passed through one of said plurality of independent, isolatable filter chambers prior to recombining said substreams downstream of said collection apparatus to form a relatively particulate matter-free gas stream, an improved method of sequentially cleaning the fabric filter means housed in each of said plurality of filter chambers of deposited particulate matter comprising:

a. continuously sensing the gas pressure differential between a point upstream of the subdivision of the particulate matter-laden gas stream into a plurality of substreams and a point downstream of the recombination of said substream into the relatively particulate matter-free gas stream;

b. continuously comparing the sensed gas pressure differential to a preselected upper limit of desired gas pressure differential;



c. when the sensed gas pressure differential reaches the preselected upper limit of desired gas pressure differential, isolating one of said plurality of filter chambers and cleaning the deposited particulate matter from the fabric filter means disposed within said isolated filter chamber;

d. returning said isolated filter chamber to operation after completion of the cleaning and thereafter maintaining all of said plurality of filter chambers in normal filtering operation without further cleaning of the fabric filter means disposed in any of said plurality of filter chambers until the sensed gas pressure differential again reaches the preselected upper limit of desired gas pressure differential;

e. while continuously performing steps (a) and (b), continuously repeating steps (c) and (d) so as to clean the fabric filter means disposed within each of the remaining uncleaned chambers of said plurality of filter chambers in a rotating sequence thereby cleaning all of said plurality of filter chambers prior to recleaning any one thereof; and

f. varying the preselected upper limit of desired gas pressure differential in response to the concentration of particulate matter in the particulate matter-laden gas stream.

4,500,327

PROCESS FOR REMOVAL OF MERCURY VAPOR AND ADSORBENT THEREFOR

Hiroshi Nishino, Suita; Toshio Aibe, and Katsuya Noguchi, both of Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 28, 1983, Ser. No. 509,232

Claims priority, application Japan, Jul. 8, 1982, 57-119409; Oct. 25, 1982, 57-186990; Oct. 25, 1982, 57-186991; Mar. 3, 1983, 58-34922

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—72 18 Claims

1. A process for the removal of mercury vapor from a gas containing the same, which comprises contacting the gas with an adsorbent comprising an activated carbon having as supported thereon (1) one or more components included in one of the three groups shown below and (2) one or more components included in the remaining two groups shown below:

Group	Component
I	sulfur
II	sulfate and nitrate of Al, V, Fe, Co, Ni, Cu, Zn or NH_4
III	oxide of iodine, oxyacid corresponding to the oxide of iodine, salt of said oxyacid, and bromide and iodide of K, Na or NH_4

9. An adsorbent for the removal of mercury vapor, which comprises an activated carbon having as supported thereon (1) one or more components included in one of the three groups shown below and (2) one or more components included in the remaining two groups shown below:

Group	Component
I	sulfur
II	sulfate and nitrate of Al, V, Fe, Co, Ni, Cu, Zn or NH_4
III	oxide of iodine, oxyacid corresponding to the oxide of iodine, salt of said oxyacid, and bromide and iodide of K, Na or NH_4

4,500,328

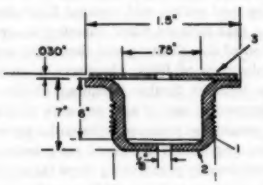
BONDED CARBON OR CERAMIC FIBER COMPOSITE FILTER VENT FOR RADIOACTIVE WASTE

Gilbert W. Brassell, 13237 W. 8th Ave., Golden, Colo. 80401, and Ronald P. Brugger, Lafayette, Colo., assignors to Gilbert W. Brassell, Golden, Colo.

Filed Feb. 22, 1983, Ser. No. 468,610

Int. Cl.³ B01D *46/00*

U.S. Cl. 55—97 18 Claims



1. A closed but safely vented, walled area comprising,

at least one wall defining a closed area, all walls being substantially impermeable to both gases and particulate matter, and the closed area containing radioactive particulate material, and

located in a wall thereof, a filter consisting essentially of a carbon bonded carbon fiber composite, ceramic bonded ceramic fiber composite or a carbon bonded ceramic fiber composite, said filter being permeable to gaseous species and retaining radioactive particles of a diameter of 0.3 μm with an efficiency of 99.97%.

11. A method of safely venting a container of radioactive particulate material, comprising incorporating in a wall thereof a filter consisting essentially of a carbon bonded carbon fiber composite, a ceramic bonded ceramic fiber composite or a carbon bonded ceramic fiber composite, said filter being permeable to gaseous species and retaining radioactive particles of a diameter of 0.3 μm with an efficiency of 99.97%.

4,500,329

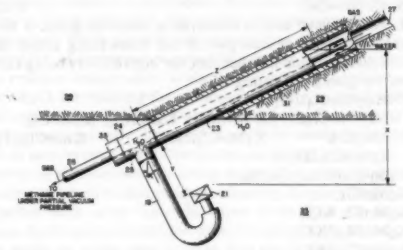
SELF-ACTUATING VACUUM GAS/LIQUID SEPARATOR

Alan A. Campoli, Irwin, and Fred Garcia, Donora, both of Pa., assignors to United States of America as represented by Secretary of the Interior, Washington, D.C.

Filed Apr. 25, 1983, Ser. No. 488,482

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—189 2 Claims



1. A self-actuating gas/liquid separator with only one moving valve part comprising:

a partial gaseous vacuum generating source;

an inclined first conduit capable of conveying a liquid therein by the force of gravity, said conduit being insertable at one end into a connection to the source of gas and liquid to be separated;

a second inclined smaller conduit capable of conveying a gas extending in the same direction as the first conduit and mounted in said first conduit, said second conduit being opened to receive gases at the end thereof nearer the source of supply for the gas and liquid to be separated, said second conduit being connected at its other end to said partial gaseous vacuum generating source to cause gases to flow from its opened end towards said vacuum generating source;

a bent third conduit in fluid communication with said first conduit and adapted to receive gravity drained separated liquids from the gas and liquid to be separated, said third conduit being vertically below the end of the first conduit which receives the gas and liquid to be separated; and

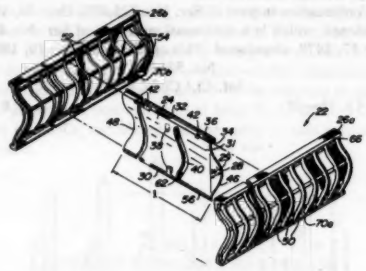
said third conduit having a liquid flow control valve constituting the one moving part of the separator, said valve being attached to the third conduit to permit the flow of excess liquid therethrough once the liquid height in the first conduit exceeds that needed to counter-balance the created partial vacuum pressure on the gas.

4,500,330

DRIFT ELIMINATOR

Wilson E. Bradley, Jr., Ellicott City, Md., and Palle Rye, Reading, Pa., assignors to Evapco, Inc., Baltimore, Md.

Filed May 31, 1983, Ser. No. 499,741
Int. Cl.³ B01D 47/00
U.S. Cl. 55—257 PV 19 Claims



1. Apparatus for removing mist from a mist laden air stream comprising:

a. a plurality of stacked blades mounted in blade holding means, each blade having an inlet side and an outlet side and being stacked to allow the mist laden air stream to flow between the blades;

b. impact means disposed on a surface of each blade against which the mist and air impacts for removing mist from the air stream;

c. a combined air stream accelerating and directing means and remnant mist removing means disposed on the outlet side of each blade; and

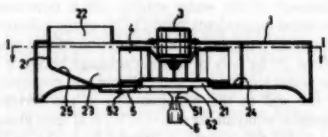
d. pressure drop reducing means disposed on the outlet side of each blade for reducing the pressure drop of the air stream across the blades.

4,500,331

KITCHEN EXHAUST APPARATUS

Chung-Tsung Cheng, 32-1, Alley 9, Lane 390, Tun Hua South Rd., Taipei

Filed Jan. 7, 1983, Ser. No. 456,371
Int. Cl.³ B01D 45/14
U.S. Cl. 55—406 10 Claims



1. A kitchen exhaust apparatus comprising:

a fan housing including:

a cylindrical portion having a curved outer wall,

an extension contiguous with said cylindrical portion and having first and second side walls which intersect said curved outer wall, said first side wall being oriented tangentially relative to said curved outer wall,

a bottom wall extending across said cylindrical portion and said extension, said bottom wall having:

a vertical inlet portion disposed in said cylindrical portion and being spaced radially inwardly from said curved outer wall, and

an upwardly sloped portion disposed in said extension between said side walls and slopding upwardly away from said cylindrical portion,

means forming an outlet port above said sloped portion,

a first drain aperture disposed in said bottom wall within said extension and located between said side walls and adjacent a lower end of said upwardly sloping portion, and

a second drain aperture disposed in said bottom wall between said inlet port and a point of intersection of said second side wall with said curved outer wall,

a motor-driven centrifugal fan arranged in said cylindrical portion above said inlet port to draw-in air and discharge the air through said outlet port and to impart centrifugal force to oleaginous and liquid particles entrained in the air, whereupon such particles travel along a path extending along said first side wall and upwardly along said sloped portion and then downwardly along said sloped portion toward said second drain aperture, with some of the particles falling through said first and second drain apertures, and

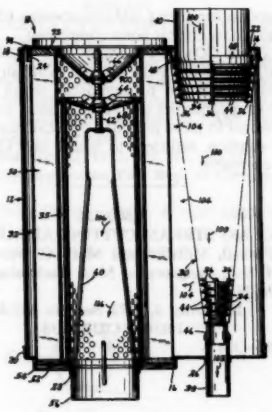
a gathering tray disposed beneath said fan housing and said first and second apertures to catch particles falling through said first and second apertures.

4,500,332

THROUGHPUT BLADE FOR LOUVERED SEPARATORS

Gary R. Gillingham, Prior Lake, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 430,736
Int. Cl.³ B01D 45/00
U.S. Cl. 55—443 8 Claims



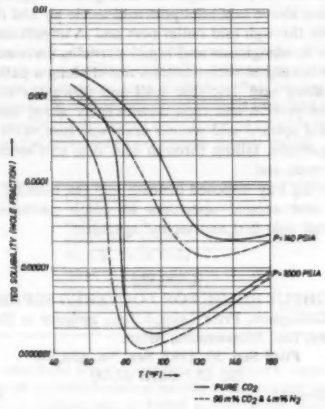
8. An inertial air cleaner for use within a housing, said cleaner including a wall and a plurality of successive adjacent louvered members spaced from the wall defining an inlet for unfiltered air between the wall and the members at one end and an outlet for more concentrated particulate laden air at the other end thereof, said members and said wall being closer to each other at the outlet than inlet, the louvered members each having leading and trailing edges and together forming a converging array converging toward an imaginary plane at the outlet end, means attached to said members for maintaining them in an adjacent relationship, said members being disposed with air passages between successive members, a tab member located intermediate said leading and trailing edges and extending from the outer peripheral surface of each member, said tab being oriented perpendicularly to the plane, wherein unfiltered air is passed between the space between the wall and the louvered members and filtered air passes between the louvered members and said tab member reducing the turbulence of filtered air.

4,500,333

AQUEOUS ELECTROLYTE DESICCATION OF SUBSTANTIALLY SUPERCRITICAL CO_2

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 29, 1983, Ser. No. 556,249
Int. Cl.[3] F25J 3/00
U.S. Cl. 62—17 3 Claims



1. A process for drying water-containing CO_2 at conditions near or above its critical point comprising:

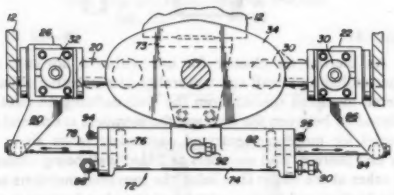
flowing said CO_2, at conditions near or above its critical point, into and out of contact with an aqueous liquid desiccant solution or pumpable slurry having water-removing capacities and efficiencies at least substantially equivalent to those provided by a calcium chloride desiccant solution, sufficient to render said CO_2 substantially non-corrosive.

4,500,334

GLASS STREAM CUTTING APPARATUS

Edward Parkell, Millville, and Mark C. Newkirk, Vineland, both of N.J., assignors to Maul Technology Corporation, Millville, N.J.

Filed Aug. 2, 1983, Ser. No. 519,446
Int. Cl.[3] C03B 5/38
U.S. Cl. 65—334 13 Claims



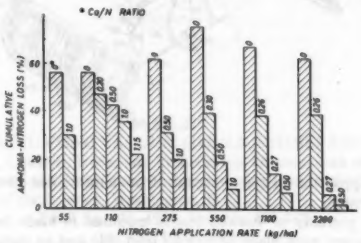
1. Apparatus for simultaneously cutting a plurality of glass streams into gobs comprising first and second arms supported at one end by a discrete carriage for reciprocation in a horizontal direction, a cam, a cam follower associated with each carriage, an electric motor coupled to said carriages by way of said cam for simultaneously reciprocating the free ends of said arms toward and away from each other, each arm supporting a plurality of blades adapted to mate with blades on the other arm, and a pneumatic spring biasing said arms towards each other and biasing said cam followers into contact with said cam, said pneumatic spring being adapted to lock said arms in an open position.

4,500,335

COMPOSITION OF MATTER AND METHOD OF USE FOR NITROGEN FERTILIZATION

Lloyd B. Fenn, El Paso, Tex., assignor to Texas A&M University, College Station, Tex.

Continuation-in-part of Ser. No. 221,435, Dec. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 039,870, May 17, 1979, abandoned. This application Aug. 19, 1983, Ser. No. 524,912
Int. Cl.[3] C05C 9/00
U.S. Cl. 71—28 8 Claims



1. The method of reducing ammonia volatilization loss from surface applied ammoniated or urea-containing soil fertilizers which comprises

analyzing the soil on which said fertilizer is to be applied so as to determine the amount of available cation Y present in the soil to react in a hydrolyzing system to form carbonates having a solubility product above about 10^{-10} grams per liter;

applying said fertilizer to the soil surface; and

applying to the soil surface in the presence of said fertilizer an effective amount of water soluble salt which has an essentially neutral solution pH and which provides in combination with any cations Y already present in the soil sufficient cations Y to suppress the formation of hydroxyl ions that would otherwise be produced in the soil according to the reaction

$$YCO_3 + H_2O \rightleftarrows Y(OH)_2 + CO_2$$

with Y=calcium or magnesium;

the amount of the water soluble salt is determined by the chemical equivalents ratio (Y/N) of the calcium and magnesium (Y) provided (a) as a cation of the water soluble salt or (b) by way of cation exchange between a cation of the water soluble salt and calcium and magnesium present in the soil to the nitrogen (N) in the fertilizer, which chemical equivalents ratio (Y/N) is at least about 0.25; and the water soluble salt is formed from the NO_3^- or Cl^- anions.

4,500,336

PROCESS FOR MAKING GRANULES CONTAINING UREA AS THE MAIN COMPONENT

Willy H. P. Van Hijfte, Assenede, and Luc A. Vanmarcke, Kaprijke-Lembeke, both of Belgium, assignors to Compagnie Neerlandaise de l'Azote (Societe Anonyme), Belgium

Filed Jun. 18, 1982, Ser. No. 390,044
Claims priority, application Netherlands, Jul. 3, 1981, 8103210; Feb. 12, 1982, 8200552
Int. Cl.[3] C05G 3/00; C05C 9/00
U.S. Cl. 71—29 2 Claims

1. In a process for preparing granules containing urea as the main component by spraying an aqueous urea solution having

a urea concentration of 85–98% by weight, to which said solution is added a crystallization retarder for the urea, said solution optionally containing other fertilizers including ammonium sulphate, ammonium dihydrogen phosphate, and diammonium hydrogen phosphate in solution or suspension, in the form of fine droplets having an average diameter between 20 and 120 microns, into a fluidized bed of urea particles at a temperature at which the water from the solution or suspension sprayed onto the particles is evaporated and the urea or fertilizer material containing urea as the main component solidifies on the particles to form granules having the desired size, the improvement comprising using a crystallization retarder consisting essentially of a water-soluble aluminum salt, wherein said aluminum salt is added to the solution or suspension in an amount equivalent to at least 0.1 to about 1.0% by weight of Al_2O_3 calculated on the urea in said solution or suspension.

4,500,337

ADHERENT CONTROLLED RELEASE MICROBIOCIDES CONTAINING HYDROLYZABLE SILANES AND ORGANIC TITANIUM COMPOUNDS

Robert W. Young, 101 W. 55th St., New York, N.Y. 10019; Samuel Prussin, Partington Ridge, Big Sur, Calif. 93920, and Norman G. Gaylord, 28 Newcomb Dr., New Providence, N.J. 07974

Filed Sep. 3, 1980, Ser. No. 183,765

The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.

Int. Cl.³ A01N *25/00*

U.S. Cl. 71—67 **36 Claims**

1. A composition capable of undergoing hydrolysis under ambient conditions to form a polymeric network capable of controlling the release of a microbiocide, consisting essentially of (a) a hydrolyzable silane selected from the group consisting of (1) a hydrocarbon substituted hydrolyzable silane, and (2) an organopolysiloxane containing hydrolyzable silane groups, or a partial hydrolyzate thereof, (b) a hydrolyzable titanium compound or a partial hydrolyzate thereof, said titanium compound being selected from the group consisting of (1) tetraesters, tetraanhydrides and tetraamides, and (2) chelates of glycols, hydroxy acids, dicarboxylic acids, diketones, ketoesters and alkanolamines, and (c) a microbiocide.

4,500,338

ADHERENT CONTROLLED RELEASE MICROBIOCIDES CONTAINING HYDROLYZABLE ORGANIC TITANIUM COMPOUNDS

Robert W. Young, 101 W. 55th St., New York, N.Y. 10019; Samuel Prussin, deceased, late of Partington Ridge, Big Sur, Calif. (by Shirley Prussin, executor), and Norman G. Gaylord, 28 Newcomb Dr., New Providence, N.J. 07974

Filed Sep. 3, 1980, Ser. No. 183,766

The portion of the term of this patent subsequent to Feb. 26, 1997, has been disclaimed.

Int. Cl.³ A01N *25/00*

U.S. Cl. 71—67 **18 Claims**

1. A composition capable of undergoing hydrolysis under ambient conditions to form a polymeric network capable of controlling the release of a microbiocide, consisting essentially of (a) a hydrolyzable titanium compound or a partial hydrolyzate thereof, said titanium compound being selected from the group consisting of (1) tetraesters, tetraanhydrides and tetraamides, and (2) chelates of glycols, hydroxy acids, dicarboxylic acids, diketones, ketoesters and alkanolamines, and (b) a microbiocide.

4,500,339

ADHERENT CONTROLLED RELEASE MICROBIOCIDES CONTAINING HYDROLYZABLE SILANES

Robert W. Young, 101 W. 55th St., New York, N.Y. 10019; Samuel Prussin, Partington Ridge, Big Sur, Calif. 93920, and Norman G. Gaylord, 28 Newcomb Dr., New Providence, N.J. 07974

Filed Sep. 3, 1980, Ser. No. 183,767

The portion of the term of this patent subsequent to Oct. 30, 1996, has been disclaimed.

Int. Cl.³ A01N *25/00*

U.S. Cl. 71—67 **34 Claims**

1. A composition of undergoing hydrolysis under ambient conditions to form a polymeric network capable of controlling the release of a microbiocide, consisting essentially of (a) a hydrolyzable silane selected from the group consisting of (1) a hydrocarbon substituted hydrolyzable silane, and (2) an organopolysiloxane containing hydrolyzable silane groups, or a partial hydrolyzate thereof, and (b) a microbiocide.

4,500,340

UREA DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Rainer Becker, Bad Durkheim; Hans Theobald, Limburgerhof; Ulrich Schirmer, Heidelberg; Wolfgang Spiegler; Walter Seufert, both of Ludwigshafen, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

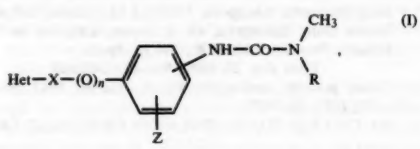
Filed Nov. 22, 1982, Ser. No. 443,523

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 3148291

Int. Cl.³ C07D *277/62, 333/14, 277/20;* A01N *47/30*

U.S. Cl. 71—90 **9 Claims**

1. A urea derivative of the formula



(I)

where

R is hydrogen, or alkyl, alkenyl, alkynyl or alkoxy of not more than 4 carbon atoms,

X is straight-chain or branched alkylene of not more than 4 carbon atoms,

Z is hydrogen, halogen, methyl or trifluoromethyl and Het is an isoxazole, oxazole, thiazole, oxadiazole, thiadiazole, pyrazole or triazole ring, unsubstituted or substituted by halogen, or by alkyl, haloalkyl, alkoxy, haloalkoxy, alkoxyalkyl or alkoxycarbonyl, each of not more than 5 carbon atoms, or by phenyl, by phenyl substituted by halogen, alkyl, alkoxy or nitro, by benzyl or by benzyl substituted by halogen, alkyl, alkoxy or nitro, or is a corresponding benzyl-fused benzothiazoyl radical, which may substituted in the same way,

and

n is 0 or 1.

4,500,341
PHENOXYCARBOXYLIC ACID AMIDE COMPOUNDS AND HERBICIDAL COMPOSITIONS

Heinz Förster, Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

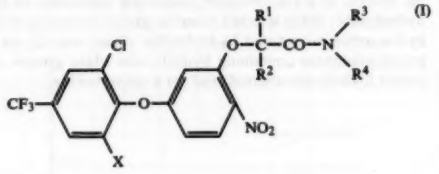
Continuation of Ser. No. 115,453, Jan. 25, 1980, abandoned. This application Oct. 21, 1981, Ser. No. 313,698

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906237

Int. Cl.³ A01N *37/20, 43/56;* C07C *103/75;* C07D *231/12*

U.S. Cl. 71—92 13 Claims

1. Phenoxylcarboxylic acid amide compound of the formula



(I)

wherein

R^1 is hydrogen,

R^2 is methyl,

R^3 is hydrogen,

R^4 is alkoxycarbonylmethyl with 1 to 4 carbon atoms in the alkoxyl group or

R^3 and R^4 together with the adjacent nitrogen atom are pyrazolyl or pyrazolyl which is substituted by one or two methyl groups and

X is hydrogen or chlorine.

10. Method of combating weeds, which method comprises applying to an area of cultivation an effective amount of a phenoxycarboxylic acid amide compound as claimed in claim 1.

4,500,342
HERBICIDALLY ACTIVE SUBSTITUTED PHENYLSULFONYLUREA DERIVATIVES AND INTERMEDIATES THEREFOR

Masahiro Aya; Junichi Saito; Kazuomi Yasui, all of Tokyo; Kozo Shiokawa, Kanagawa; Norihisa Morishima, Tokyo, and Toshio Goto, Kanagawa, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

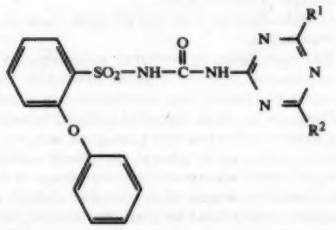
Filed Jan. 20, 1982, Ser. No. 340,903

Claims priority, application Japan, Jan. 26, 1981, 56-8977; Jun. 20, 1981, 56-94571

Int. Cl.³ C07D *251/46;* A01N *43/66;* C07D *251/42;* C07C *155/02*

U.S. Cl. 71—93 8 Claims

1. A phenoxyphenylsulfonylurea derivative of the formula



in which

R^1 and R^2 each independently is methyl or methoxy.

4,500,343
OXAZOLYL AND THIAZOLYL AMIDES AS HERBICIDES

Kenneth W. Burow, Jr., Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 30, 1982, Ser. No. 429,765

Int. Cl.³ A01N *43/74, 43/80, 43/82*

U.S. Cl. 71—76 3 Claims

1. A method for controlling undesired plants which comprises applying to the plants a growth inhibiting amount of 4-chloro-N-[5-(1,1-dimethylethyl)-3-isoxazolyl]-2-methylbutanamide.

4,500,344
HERBICIDAL ORTHO-(ALKOXY)-BENZENESULFONAMIDES

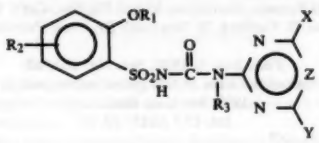
Robert W. Freerksen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 21, 1983, Ser. No. 474,873

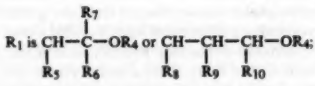
Int. Cl.³ C07D *251/18, 251/46, 251/52;* A01N *43/70*

U.S. Cl. 71—93 24 Claims

1. A compound of the formula:



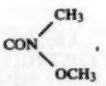
wherein



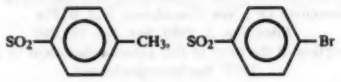
R_2 is H, F, Cl, Br, CH_3, OCH_3 or CF_3;

R_3 is H or CH_3;

R_4 is H, $COCH_3$, COC_2H_5, $COCH_2CH_2CH_3$, $COCH(CH_3)_2$, COC_6H_5, $CONHCH_3$, $CONHC_2H_5$, $CON(CH_3)_2$,



$CONHC_6H_5$, SO_2CH_3, $SO_2C_2H_5$, $SO_2C_6H_5$,



or SO_2CF_3;

R_5 is H or CH_3;

R_6 is H or CH_3;

R_7 is H or CH_3;

R_8 is H or CH_3;

R_9 is H or CH_3;

R_{10} is H or CH_3;

Z is N;

X is CH_3 or OCH_3; and

Y is CH_3, C_2H_5, OCH_3, OC_2H_5, CH_2OCH_3, $CH(OCH_3)_2$,

NH_2, $NHCH_3$ or $N(CH_3)_2$;
provided that
(1) when R_6 and R_7 are both CH_3, then R_4 is H; and
(2) when either R_8, R_9 or R_{10} is CH_3, then the others must be H;
and their agriculturally suitable salts.

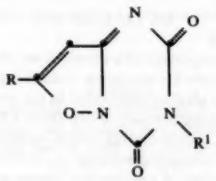
17. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,500,345
ISOXAZOLOTRIAZINDIONES AND PLANT GROWTH INHIBITING USE THEREOF

Kurt H. Pilgram, and Thomas P. Price, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 18, 1983, Ser. No. 553,020
Int. Cl.³ A01N *31/08;* **C07D** *498/04*
U.S. Cl. 71—93 **6 Claims**

1. A compound of the formula



wherein R is alkyl of one to six carbon atoms, alkynyl of three to six carbon atoms, cyclopropyl or 1-methylcyclopropyl, an R^1 is alkyl or alkoxy of from one to four carbon atoms, and the hydrohalide salts thereof.

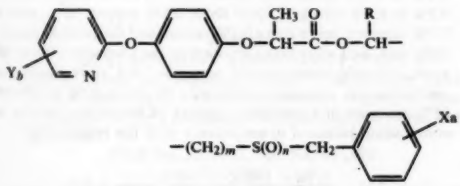
3. A method for inhibiting the growth of unwanted plants at a locus which comprises applying to the locus a plant growth inhibiting effective amount of a compound of claim 1.

4,500,346
SUBSTITUTED PHENOXYPROPIONATES AND HERBICIDAL COMPOSITIONS CONTAINING SAME AND THEIR HERBICIDAL USE

Junichi Saito; Kazuomi Yasui, both of Tokyo; Kozo Shiokawa, Kanagawa, and Atsumi Kamochi, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Apr. 11, 1983, Ser. No. 483,974
Claims priority, application Japan, Apr. 20, 1982, 57-64702
Int. Cl.³ C07D *213/64;* **A01N** *43/40*
U.S. Cl. 71—94 **14 Claims**

1. Substituted phenoxypropionates of the formula



in which

Y represents a halogen atom or a trifluoromethyl group and b is 1 or 2,
R represents a hydrogen atom or a methyl group,
X represents a hydrogen atom, a halogen atom, a nitro group, a lower alkyl group or a lower alkoxy group,
a and m independently is 1 or 2, and
n is 1 or 2.

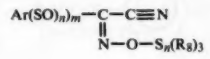
12. A method of combating weeds which comprises applying to the weeds, or their habitat, a herbicidally effective amount of a substituted phenoxypropionate as claimed in claim 1.

4,500,347
OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

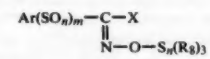
Division of Ser. No. 271,310, Jun. 8, 1981, abandoned, which is a division of Ser. No. 068,252, Aug. 20, 1979, Pat. No. 4,294,772.
This application Apr. 6, 1983, Ser. No. 482,389
Claims priority, application Switzerland, Aug. 31, 1978, 9200/78
Int. Cl.³ A01N *55/04*
U.S. Cl. 71—97 **21 Claims**

1. A composition for use in protecting crops against the herbicidal action of a haloacetanilide comprising an effective amount of a compound of the formula:



wherein
n is 0, 1 or 2,
m is 0 or 1,
Ar is unsubstituted phenyl, phenyl substituted with from one to three substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and halo, or naphthyl, and
R_8 is alkyl of 1 to 4 carbon atoms, benzyl or phenyl, in a quantity sufficient to provide a protective action against said haloacetanilide, in combination with an inert liquid or solid carrier for the compound.

6. In the method of combating weed growth in a crop through the application of a herbicidal haloacetanilide, the improvement which comprises applying to said crop, the seed or seedling from which said crop is grown, or to the habitat of the crop's growth a compound of the formula:



wherein
n is 0, 1 or 2,
m is 0 or 1,
X is hydrogen, cyano, alkyl of 1 to 4 carbon atoms or carboalkoxy in which alkoxy contains 1 to 4 carbon atoms,
Ar is unsubstituted phenyl, phenyl substituted with from one to three substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and halo, or naphthyl, and
R_8 is alkyl of 1 to 4 carbon atoms, benzyl or phenyl, in a quantity sufficient to protect the crop from the herbicidal effects of said haloacetanilide.

4,500,348
OIL-IN-WATER EMULSIONS, AND THEIR USE

Heinz Hausmann, Leichlingen; Heinz J. Niessen, Bergisch Gladbach; Otto Telle, Cologne, and Hermann Neumaier, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 355,076

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111934

Int. Cl.³ A01N *41/00*

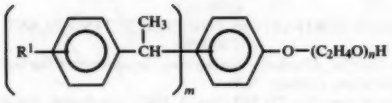
U.S. Cl. 71—103 **13 Claims**

1. Oil-in-water emulsion comprising

(a) 5 to 80% by weight of at least one agrochemically active compound having a maximum solubility of 0.5% by weight in water at 20° C.,

(b) 3 to 15% by weight of at least one alkylaryl polyglycol ether of the formula

(I)



wherein

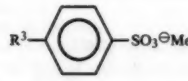
R^1 represents a hydrogen atom or an alkyl group having 1 to 12 carbon atoms,

m is 2 or 3 and

n is an integer from 12 to 40,

in admixture with an alkylarylsulphonic acid salt of the general formula

(II)



wherein

R^3 represents an alkylgroup having 9 to 30 carbon atoms and

$M^{\oplus}$ represents a sodium cation or an equivalent of a calcium cation, and

(c) water.

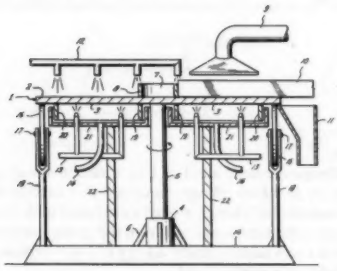
4,500,349
PRODUCTION OF ROUND SALT COATED METAL GRANULES

Edward J. Skach, Jr., Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 334,201, Dec. 24, 1981, abandoned. This application Jul. 29, 1983, Ser. No. 518,775

Int. Cl.³ C22C *1/04*

U.S. Cl. 75—0.5 B **6 Claims**



1. A process which consists essentially of feeding a molten salt material, having small metal particles dispersed therein, to a non-central portion of the top side of a flat, planar, horizontal, circular, rotating sheet or plate,

maintaining the material in a substantially dry or inert atmosphere while

cooling the material on said sheet or plate to a state at which it is brittle, friable, or plastic,

and

scraping the cooled material from the rotating sheet or plate before it reaches the point at which it was fed to the plate, said rotating being done at a speed which is less than that which would cause movement of the material across the surface of the plate by centrifugal action.

4,500,350
DISINTEGRATION OF CHROMITES

Johann-Nikolaus Meussdoerffer, Leverkusen; Hans Niederprüm, Monheim; Hans-Georg Nieder-Vahrenholz, Cologne, and Wolfgang Bockelmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 766,414

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1976, 26071318

Int. Cl.³ C22B *1/02*

U.S. Cl. 75—1 R **7 Claims**

1. In the disintegration of a chromite or chromium containing residue, wherein the chromium-containing material is disintegrated with an alkaline compound in the presence of oxygen and a diluent at a temperature above about 800° C. and thereafter leached, the improvements which comprise employing as said chromium-containing material a chromite selected from the group consisting of gangue-rich chemical grade chromite, metallurgical-grade chromite and refractory-grade chromite, and pre-roasting the chromium-containing material for about 2 hours at 1000° to 1100° C. whereby upon subsequent disintegration and leaching there is obtained a higher yield of chromium.

4,500,351
CAST DUPLEX STAINLESS STEEL

Armand P. Bond, Livonia; Abraham Poznansky, and Paul J. Grobner, both of Ann Arbor, all of Mich., assignors to Amax Inc., Greenwich, Conn.

Filed Feb. 27, 1984, Ser. No. 583,903

Int. Cl.³ C22C *38/42*

U.S. Cl. 75—128 N **3 Claims**

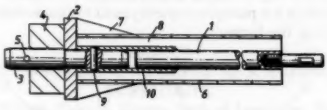
1. A casting made of an alloy consisting essentially of about 0.02% to 0.05% carbon, about 23% to about 25% chromium, about 8% to 12% nickel, about 5% to 7% molybdenum, about 0.4% to 0.8% manganese, about 0.1% to 0.3% silicon, about 0.1% to 0.4% nitrogen, up to about 0.5% copper, up to about 0.1% tungsten, up to about 0.1% cerium and the balance essentially iron, said alloy being resistant to the corrosive effects of acids, chloride solutions and seawater, said alloy having a microstructure consisting essentially of about 40% to about 55% austenite in a continuous matrix of ferrite and having a composition balanced in accordance with the relationship:

$$0.85 > \frac{\%\ Ni + 30\%\ C + 25\%\ N + 1}{\%\ Cr + 1.5\%\ Mo - 10} > 0.68.$$

4,500,352
PRODUCTION OF CAST IRON

George E. Else, Chesterfield; Cyril Millward, Heanor; Ronald H. T. Dixon, Chesterfield, all of England, and Knut Jörgensen, Hardanger, Norway, assignors to Stanton and Staveley Limited, Derbyshire, England and A/S Bjolvefossen, Oslo, Norway

Filed Nov. 23, 1983, Ser. No. 554,971
Claims priority, application United Kingdom, Dec. 1, 1982, 8234252
Int. Cl.³ C22C *33/08*
U.S. Cl. 75—130 B 13 Claims

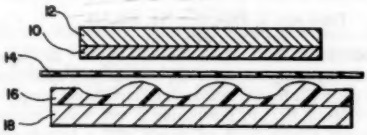


1. Apparatus for adding magnesium containing material to molten iron in the production of nodular or modified graphite irons commprising a block of magnesium containing material, and a plunging arm, the block and the arm being shaped such that the block is securely mountable on the arm with the arm projecting into the block substantially to its center of mass, the block being formed by mixing a powdered or granular combination of at least metallic magnesium and a magnesium alloy with a binder and compacting to the desired configuration of the block.

4,500,353
ELASTOMERIC COMPRESSIBLE MIXTURE

Judith A. Maszalec, 464 Riverside Ave., Rutherford, N.J. 07070

Filed Jan. 9, 1984, Ser. No. 569,523
Int. Cl.³ B22F *1/00*
U.S. Cl. 75—252 5 Claims



1. An elastomeric compressible mixture having the compressible properties of stiff rubber or rubber-like compounds and having heat transfer characteristics of metal such as aluminum, this mixture for use as a flat sheet or as a roll covering and is disposed in contiguous relationship with a heat conductive metal backup, said mixture including:

(a) at least two parts polymerized tetrafluoro ethylene powder, and

(b) the remainder aluminum powder in a range of fifty to seventy-five percent and of rubber or rubber-like materials about forty eight to twenty three percent.

4,500,354
HEAT SENSITIVE RECORDING PAPERS

Boris J. Katsen, N. Tonawanda; Robert T. Brinkworth, Lakeview; Daniel J. Kay, Amherst, and James A. Riester, N. Tonawanda, all of N.Y., assignors to Graphic Controls Corp., Buffalo, N.Y.

Filed Sep. 27, 1982, Ser. No. 423,851
Int. Cl.³ C09D *11/00*
U.S. Cl. 106—21 19 Claims

1. A water-stable phenol-amine complex having limited water solubility and for use in a thermal-sensitive paper coating containing a chromogenic compound,

said complex being characterized in that the ratio of OH^- groups of the phenol to amine groups of the amine is essentially 2:1, and being further characterized in that the amine is a lower aliphatic amine of up to C-6 and selected from the group consisting of primary amines, secondary amines forming aminophenolic complexes in a 1:1 ratio, and mixtures thereof,

said phenol being selected from the group consisting of phenols which have the capability of forming, in water, a molecular complex with amines, in a ratio of two OH^- groups to one amine group when a primary amine is used,

said complex in said coating being responsive to heat applied thereto to effect dissociation of said complex to liberate said phenol for reaction with said chromogenic compound to produce colored trace indicia.

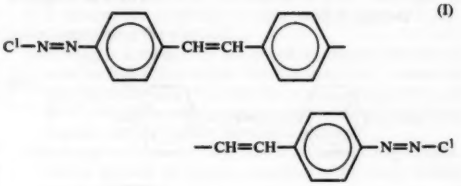
4,500,355
AQUEOUS INK COMPOSITION

Masaru Shimada, Shizuoka, and Masaomi Sasaki, Susono, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

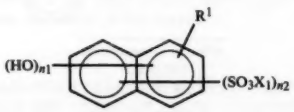
Filed Sep. 28, 1983, Ser. No. 536,928
Claims priority, application Japan, Oct. 29, 1982, 57-189203
Int. Cl.³ C09D *11/02*
U.S. Cl. 106—22 12 Claims

1. An aqueous ink composition comprising an aqueous solution of a water-soluble first dye component and a humectant dissolved in water, said first dye component being at least one dye selected from the group consisting of a cyan azo dye of formula (I), a magenta azo dye of formula (II), and a yellow azo dye of formula (III);

(I)

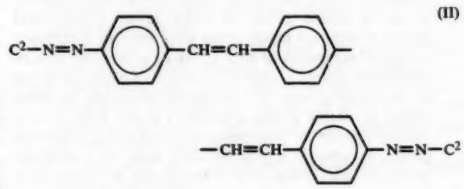


wherein C^1 represents



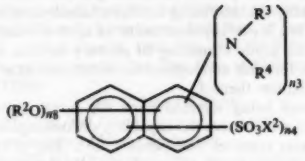
wherein R^1 represents hydrogen, an unsubstituted or substituted amino group, a sulfo-group-substituted alkyl carbamoyl group, a sulfo-group-substituted phenyl carbamoyl group or a sulfo-group-substituted naphthyl carbamoyl group; X^1 represents hydrogen, Na, K, Li or an organic amine; n_1 is an integer of 1 or 2; and n_2 is an integer of 0 through 3;

(II)

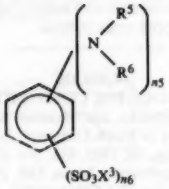


wherein C^2 represents

-continued

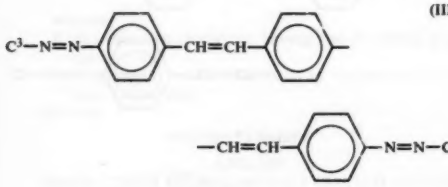


or

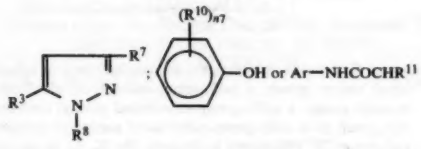


wherein R^2 represents hydrogen or an alkyl group; R^3 and R^4 independently represent hydrogen, an alkyl group, an acyl group, an unsubstituted or substituted phenyl group, or an unsubstituted or substituted phenylsulfonyl group; R^5 and R^6 independently represent hydrogen or an alkyl group; X^2 and X^3 independently represent hydrogen, Na, K, Li or an organic amine; n_3, n_5 and n_6 each are an integer of 1 or 2; n_8 is an integer of 0 or 1; and n_4 is an integer of 1 through 3; and

(III)



wherein C^3 represents



wherein R^7 represents an alkyl group, an unsubstituted or substituted phenyl group, a cyano group, a hydroxyl group, an alkoxy group, an amino group, an acylamino group, an anilino group, an ureido group, a carbamoyl group, a carboxyl group or an alkyl ester of a carboxyl group; R^8 represents an alkyl group or an unsubstituted or substituted phenyl group; R^9 represents a hydroxyl group or an amino group; R^{10} represents hydrogen, an alkyl group, an alkoxy group, a hydroxyl group, halogen or a carboxyl group; R^{11} represents an acetyl group, a benzoyl group, a carboxyl group, an alkyl ester of a carboxyl group, a cyano group, or an amido group; Ar represents a sulfo- group-substituted phenyl group or naphthyl group; and n_7 is an integer of 0 through 3.

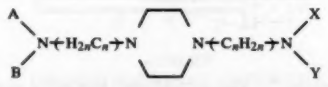
4,500,356

METHYLENEPHOSPHONIC ACID DERIVATIVES OF BIS(AMINOALKYL)PIPERAZINES AS CEMENT SET RETARDING AGENTS

Druce K. Crump, Lake Jackson; Jaime Simon, Angleton, and David A. Wilson, Richwood, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 24, 1984, Ser. No. 583,527
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 **16 Claims**

1. In a process for retarding the setting of an aqueous cement slurry which comprises adding to said slurry an organic phosphonate, the improvement which comprises employing a compound which is a phosphonomethylated bis(aminoalkyl)piperazine having the formula



wherein n is 2–3 and wherein substituents A, B, X and Y each are independently selected from radicals consisting of hydrogen, hydroxyalkyl (wherein the alkyl group contains 2–6 carbon atoms); methylenephosphonic; methylene-, ethylene- and propylenesulfonic; hydroxymethyl-, hydroxyethyl- and hydroxypropylsulfonic acid radicals; carboxylic acid radicals (having 2–4 carbon atoms) and the alkali, alkaline earth metal, ammonium and amine salts of any of the phosphonic, sulfonic or carboxylic acid derivatives, and wherein at least one of A, B, X and Y is a methylenephosphonic acid radical or a salt thereof.

4,500,357

OIL FIELD CEMENTING METHODS AND COMPOSITIONS

Lance E. Brothers, Lawton, and S. Prabhakara Rao, Duncan, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 3, 1984, Ser. No. 596,228
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 **20 Claims**

1. A cementing composition for use in cementing operations for oil and gas wells having bottom hole circulating temperatures above about 200° F. comprising a salt water cement slurry, a water soluble form of borate, and a terpolymer, wherein said terpolymer is comprised of about 10-65 mole precent of a strong acid monomer selected from the group consisting of sodium vinylsulfonate, 2-acrylamido, 2-methyl propane sulfonic acid, and vinyl benzene sulfonic acid; about 10–60 mole percent of a weak acid monomer selected from the group consisting of acrylic acid, methacrylic acid, ethacrylic acid and vinyl acetic acid; and about 10-60 mole percent of a nonionic monomer selected from the group consisting of acrylamide, N-vinylpyrrolidone and N,N dimethylacrylamide; wherein the average molecular weight of said terpolymer is between about 10,000 and about 100,000.

4,500,358

FOAM CAPSULES

Jean P. Mayer, Colmar, France, and Fritz Wittwer, Lupsingen, Switzerland, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 438,147, Oct. 29, 1982, abandoned. This application Apr. 13, 1983, Ser. No. 484,723
Int. Cl.³ C08L 89/00; A01N 25/34; B28B 1/38
U.S. Cl. 106—122 **32 Claims**

1. A method for the formation of capsule halves by the dipmolding technique and thereby for the production of a foam capsule with telescopically engageable body and cap halves of an unfilled foam capsule adopted to be filled, the joined halves

of the capsule providing the finished foam capsule adopted for filling, which method comprises

A. dissolving gelatin water to make an aqueous gelatin solution;

B. mixing a gas into the aqueous gelatin solution to make a gas and aqueous gelatin solution;

C. micronizing the gas and aqueous gelatin solution to make a micronized gas and aqueous gelatin solution; and

forming by the dipmolding technique telescopically engageable body and cap halves of unfilled foam capsules from the micronized gas and aqueous gelatin solution.

4,500,359

WAX COMPOSITION USEFUL AS A BEESWAX SUBSTITUTE

John H. Woods; Toby R. Graves, both of Longview, Tex.; William E. Nasser, Tulsa, Okla., and Ashvinkumar N. Jagtap, Longview, Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 156,903, Jun. 6, 1980, abandoned. This application Oct. 8, 1982, Ser. No. 433,601

Int. Cl.³ C08L *91/06*

U.S. Cl. 106—270 **18 Claims**

1. A wax composition useful as a beeswax substitute comprising (1) 40–90% by weight of a wax alcohol ester whose alcohol moiety is a linear polyalkylene group of about 4 to 70 carbons and whose acid moiety is that of a monofunctional straight chain carboxylic acid of from 2 to about 33 carbon atoms, said wax alcohol ester having an acid number of 0.5 and a melting point of 95° to 180° C. and (2) 5–50% by weight of an oxidized hydrocarbon wax of about 22–100 carbons.

4,500,360

SLIDING MEMBER MADE OF FIBER-REINFORCED METAL

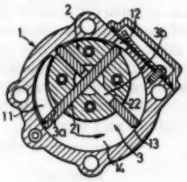
Masao Wakayama, Nagoya; Makoto Takemura, and Takao Kasagi, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 22, 1982, Ser. No. 443,736

Claims priority, application Japan, Nov. 25, 1981, 56-189474

Int. Cl.³ C09D *1/00*; F01C *21/00*

U.S. Cl. 106—286.5 **1 Claim**



1. In a compressor having a vane of which a portion is disposed with a normally small clearance from another part of the compressor, made of iron-based metal, for potential sliding contact with such other part under some operating condition of the compressor,

the improvement wherein:

said vane portion is made of carbon fiber-reinforced aluminum having a coefficient of thermal expansion of from 0.9 to 1.6×10^{-5}/°C. from 0° C. to 250° C.;

said carbon fiber-reinforced aluminum containing 15–40 percent, by volume, of carbon fiber, which is irregularly and isotropically distributed within a matrix of aluminum.

4,500,361

PROCESS FOR THE PREPARATION OF TREATED LEAD CHROMATE BASED PIGMENTS

Carlos M. Solé, and Juan A. Vallvey, both of Barcelona, Spain, assignors to Colores Hispania, S.A., Spain

Filed Apr. 28, 1983, Ser. No. 489,297

Int. Cl.³ C04B *31/02*; C08K *3/00*

U.S. Cl. 106—298 **14 Claims**

1. In a process for preparing crystalline lead chromate-based pigments by precipitation from lead nitrate and sodium dichromate, the improvements comprising:

(a) aging the precipitated pigment crystals to allow release of the lead ions by means of time and/or temperature conditions to allow the later precipitation of the lead ions absorbed or occluded in the crystal and rearranging of the crystals;

(b) precipitating excess lead ion with sodium or potassium salts;

(c) treating the pigment crystals with silicon hydroxide;

(d) coating the crystals with hydrated oxides of a metal at two valency levels thereof; and

(e) treating the crystals with phosphorous salts.

4,500,362

PROCESS FOR PREPARING AQUEOUS DISPERSION OF PIGMENT

Osamu Takahashi; Nobuo Yamamura; Yasuo Mukunoki, all of Kanagawa; Shungi Ogawa, Tokyo, and Yutaka Nakagawa, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 15, 1983, Ser. No. 552,188

Claims priority, application Japan, Nov. 15, 1982, 57-200862

Int. Cl.³ C09C *1/00*; C09B *1/00*; C04B *31/40*

U.S. Cl. 106—309 **11 Claims**

1. A process for preparing an aqueous dispersion of a pigment, comprising the steps of:

dissolving in a mixture of water and an organic solvent an ionic surface active agent which is insoluble in water or has a solubility of 0.1% or less in water at a temperature of 25° C., the ionic surface active agent being soluble in the organic solvent thereby forming a solution;

removing the organic solvent from the solution by distillation to provide an aqueous emulsion of the ionic surface active agent; and

dispersing a pigment in the form of particles in the aqueous dispersion of the ionic surface active agent to form an aqueous dispersion of the pigment.

4,500,363

METHOD OF EXTRACTING PERCHLORETHYLENE FROM DRY CLEANER FILTER CARTRIDGES

Ernest O. Roehl, 16262 Rascal La., Huntington Beach, Calif. 92649

Filed Sep. 14, 1983, Ser. No. 531,958

Int. Cl.³ B01D *41/02*

U.S. Cl. 134—10 **9 Claims**

1. A method of removing perchlorethylene dry cleaning fluid from spent dry cleaner filter cartridges which comprises the steps of:

(a) Disjoining the spent dry cleaner filter cartridges into housing components, charcoal components and filter media components;

(b) Immersing said charcoal and said filter media components into a boiling chamber having water therein;

(c) Maintaining said perchlorethylene/water mixture at a temperature equivalent to the boiling point of said perchlorethylene/water azeothrope to produce perchlorethylene-containing vapors;

(d) Condensing said perchlorethylene-containing vapors into a condensate;

(e) Collecting said condensate into a drying tank;

(f) Separating the perchlorethylene from said water in said condensate; and

(g) Collecting said perchlorethylene into a collecting container.

4,500,364

METHOD OF FORMING A PROTECTIVE ALUMINUM-SILICON COATING COMPOSITION FOR METAL SUBSTRATES

Richard C. Krutenat, New Providence, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 23, 1982, Ser. No. 371,257
Int. Cl.³ C23C *1/08*
U.S. Cl. 148—6.14 R **4 Claims**

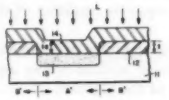
1. A method of coating a metal substrate which comprises applying to said substrate a hypereutectic aluminumsilicon composition in the form of a slurry in a liquid vehicle comprising a mixture of (1) an Al-Si eutectic, Al-Si hypereutectic or elemental aluminum powder in combination with (2) elemental silicon powder, heating the coating composition to a temperature high enough to form eutectic liquid but low enough to retain elemental silicon in solid form, said heating taking place in the presence of an oxidation-protective pack which comprises silica sand mixed with about 2 to about 30% by weight silicon powder and about 0.05 to about 2% by weight NaCl, and then cooling to form the final coating which contains aluminides and silicides formed from the interaction with the metal substrate, said composition mixture components being present in sufficient amounts to provide the final coating with a net silicon content of about 20 to about 80% by weight.

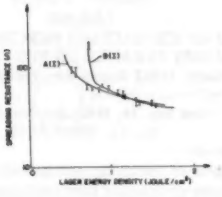
4,500,365

LASER TREATING IMPLANTED SEMICONDUCTOR SURFACE THROUGH PHOTO-RESIST LAYER

Haruhisa Mori, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 204,907, Nov. 7, 1980, abandoned. This application Feb. 16, 1983, Ser. No. 467,188
Claims priority, application Japan, Nov. 12, 1979, 54-146347
Int. Cl.³ H01L *21/263*
U.S. Cl. 148—1.5 **7 Claims**





1. A method of manufacturing a semiconductor device wherein an ion implanted surface region of a semiconductor substrate is heated by irradiating with a laser beam of wavelength λ, said method comprising the steps of:

(a) selectively placing an impurity into said semiconductor substrate by ion implantation using an insulating layer as a mask;

(b) forming a light transmitting film, comprising a photoresist and having a refraction index n, on said ion implanted surface region of the semiconductor substrate and on the insulating layer formed on the non-implanted surface of the semiconductor substrate, said light transmitting film having a uniform thickness defined by mλ/4n, where m is an odd natural number; and

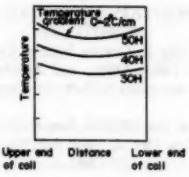
(c) irradiating said laser beam through said light transmitting film for selectively heating and activating said ion implanted surface region of the semiconductor substrate.

4,500,366

PROCESS FOR PRODUCING A GRAIN-ORIENTED ELECTROMAGNETIC STEEL STRIP OR SHEET

Katsuaki Kokai, and Takeo Ohta, both of Kitakyusyushi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 4, 1982, Ser. No. 435,457
Int. Cl.³ H01F *1/04*
U.S. Cl. 148—111 **4 Claims**



1. In a process for producing a grain-oriented electromagnetic steel strip or sheet, which comprises annealing, for primary recrystallization, a cold rolled electromagnetic steel strip or sheet having a final thickness, and subjecting said strip or sheet to secondary recrystallization annealing by heating said strip or sheet so that every portion of said strip or sheet along the width of said strip, or the width or length of said sheet, will pass through the boundary between the temperature ranges for primary recrystallization and seconary recrystallization with a predetermined temperature gradient, the improvement which comprises:

applying a principal supply of heat to one of a pair of opposite ends of a coil of said strip, which ends of said coil define the width of said strip, or to one of a pair of opposite ends of a stack of a plurality of said sheets, which ends of said stack define the width or length of said sheets, while keeping the inner and outer peripheral surfaces of said coil or the front and rear surfaces of said stack insulated against heat by a heat insulating material;

moving said heat insulating material, or said coil or stack, to gradually expose said surfaces of said coil or stack;

applying an additional supply of heat to said exposed surfaces to heat an enlarged area of said coil or stack from said one end thereof to the other end thereof; and

cooling said other end of said coil or stack, whereby said secondary recrystallization annealing is effected, with a predetermined temperature gradient, on every portion of said strip or sheet along the width of said strip, or the width or length of said sheet.

4,500,367

LPE GROWTH ON GROUP III-V COMPOUND SEMICONDUCTOR SUBSTRATES CONTAINING PHOSPHORUS

Vassilis G. Keramidas, Warren, and Jose A. Lourenco, Union, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 31, 1983, Ser. No. 547,333
Int. Cl.³ H01L *21/208*
U.S. Cl. 148—171 **14 Claims**

1. A method for liquid phase epitaxially growing, upon a first Group III-V semiconductor compound substrate containing phosphorus, a layer of a second Group III-V semiconductor compound comprising the steps of:

(a) heating in a first gas atmosphere comprising nitrogen or

helium to a first predetermined temperature both the substrate and a molten solution from which the second compound can be grown;

(b) contacting the substrate with the molten solution in a second gas atmosphere comprising hydrogen; and

(c) cooling the substrate and the molten solution in the second atmosphere at a predetermined rate, whereby the layer of the second compound epitaxially grows upon the substrate.

4,500,368

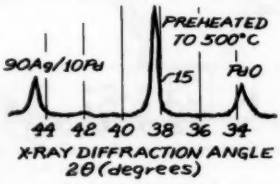
AG/PD ELECTRODING POWDER AND METHOD FOR MAKING

Galeb H. Maher, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed May 12, 1983, Ser. No. 493,863

Int. Cl.³ H01G *1/01*

U.S. Cl. 148—431 **6 Claims**



1. A metal electroding powder for use in making monolithic ceramic capacitors comprised of a silver-palladium alloy powder having a composition by weight of 90Ag/10Pd and a fine palladium oxide formed at the surfaces of the particles of said alloy powder to elevate the temperature at which said alloy will sinter, the presence of said alloy and said palladium oxide being detectable by X-ray defraction angle analysis.

4,500,369

EMULSION EXPLOSIVE

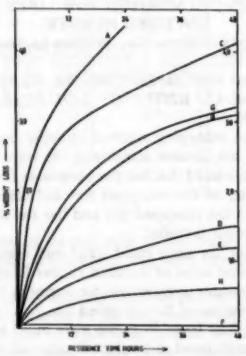
Arne Tag; Bjorn R. Petterson, both of Oslo, and Erik C. Nygaard, Porsgrunn, all of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Dec. 14, 1983, Ser. No. 561,206

Claims priority, application Norway, Dec. 23, 1982, 824351

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—2 **9 Claims**



1. An emulsion explosive of the water-in-oil type comprising:

a total of 60–90 percent by weight of both ammonium nitrate and calcium nitrate;

4–15 percent by weight of a crystallization temperature lowering agent;

an emulsifier;

a density reducing agent; and

2–6 percent by weight of at least one hydrocarbon fuel selected from the group consisting of wax and oil;

wherein the content of water in said explosive substantially consists of water of crystallization bound to said calcium nitrate.

4,500,370

EMULSION BLASTING AGENT

Ernest A. Hajto, North Bay, Canada, assignor to Du Pont Canada Inc., Montreal, Canada

Filed Dec. 27, 1983, Ser. No. 565,776

Claims priority, application United Kingdom, Mar. 15, 1983, 8307134

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—109.6 **10 Claims**

1. A method for producing a water-in-oil emulsion-type explosive composition which comprises combining with agitation, a liquid carbonaceous fuel, an aqueous solution of at least one inorganic oxidizing salt, dispersed gas bubbles and ingredients A and B, ingredient A being selected from the group consisting of oleic acid, linoleic acid, and mixtures thereof, and ingredient B being selected from the group consisting of phosphates and carbonates of ammonia and alkali metals, at least one of said ingredients A and B being added during agitation.

4,500,371

HEAT-RECOVERABLE ARTICLE

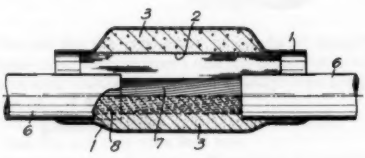
Hubert De Groot, Duisburg, Belgium, assignor to N.V. Raychem S.A., Kessel-lo, Belgium

Filed Feb. 14, 1984, Ser. No. 580,050

Claims priority, application United Kingdom, Feb. 14, 1983, 8304027

Int. Cl.³ H01B *13/06*; B32B *31/26*

U.S. Cl. 156—48 **15 Claims**



1. An assembly for applying a heat-activatable adhesive to an elongate substrate, which comprises:

a heat-recoverable driver sleeve;

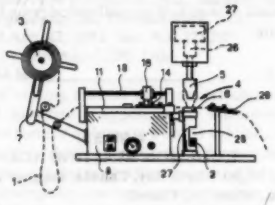
a particulate heat-activatable adhesive; and temporary restraining means for locating the adhesive adjacent an inner surface of the sleeve until heat-recovery of the sleeve.

13. A method of producing a cable block, which comprises: surrounding a portion of the cable having a section thereof at least partially bare of jacket with an assembly according to claim 1; and heating the assembly to recover the sleeve and activate the adhesive, recovery causing the adhesive to be displaced from the temporary restraining means and driven into the core of the cable at the bared section thereof.

4,500,372
METHOD AND APPARATUS FOR CUTTING WOVEN LABELS

Sergio Mion, Padua, Italy, assignor to A. Mion S.p.A. Nastrificio, Padua, Italy

Filed May 20, 1982, Ser. No. 380,068
Claims priority, application Italy, Dec. 10, 1981, 41703 A/81
Int. Cl.³ B29C *27/08*; B32B *31/18*
U.S. Cl. 156—73.3 **2 Claims**



1. A method for cutting woven labels from a ribbon of labels, said method comprising: feeding a ribbon of fabric labels woven from synthetic yarn to a cutting machine; guiding the labels to an ultrasonic wave cutting device; positioning each label between a first cutting element defining an ultrasonic wave emitter and, respectively, a second cutting element having a continuous closed cutting edge defining the outline of the label and having an opening within said closed cutting edge; pressing the label between the cutting elements and emitting an ultrasonic wave impulse, causing the simultaneous cutting of the label from the ribbon and the welding of the fabric around its cut edges; providing a tubular collector positioned below said second cutting element and in communication with said opening; and collecting said cut labels in said tubular collector.

4,500,373
PROCESS FOR PRODUCING COINCIDENTLY EMBOSSED DECORATIVE SHEETS

Hajime Kubota, Kyoto, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed May 4, 1982, Ser. No. 374,744
Claims priority, application Japan, Sep. 29, 1981, 56-154084; Feb. 8, 1982, 57-18539
Int. Cl.³ B32B *5/18, 31/00*; B29H *7/20*; D06N *7/04*
U.S. Cl. 156—79 **10 Claims**

1. A process for producing a decorative sheet with a concave pattern coincident with a design or color pattern, which comprises:

forming in sequence on a paper for decorative use a printed layer of ordinary ink having a desired pattern and then a printed layer of heat-foamable ink having a desired pattern thereby forming a layered product;

impregnating the layered product with a thermosetting resin liquid thereby forming a resin layer on the layered product;

drying the layered product with the resin layer thereby forming a dried layered product;

laminating the dried layered product with a substrate thereby forming a laminate sheet;

sandwiching the laminate sheet between a pair of heating plates and molding the laminate sheet by heating and pressing simultaneously curing the thermosetting resin and rendering, the laminate sheet into an integral structure by curing the resin layer, and simultaneously foaming the heat foamable ink by heating and pressing the laminate sheet, thereby forming cells;

coating the laminate sheet with a solvent such that the solvent is absorbed into said cells formed by the heat-foamable ink during the heating and pressing of the laminate and said cells swelling with the solvent, extending beyond the resin layer; and

rubbing the laminate sheet to remove said cells swollen by the solvent.

4,500,374
DISPLAY PANEL AND PROCESS FOR FORMING PATTERN THEREFOR

Shigeko Nakazima, 4-11-7, Nishiogi Minami, Suginami-ku, Tokyo, Japan

Filed Jul. 21, 1982, Ser. No. 400,382
Claims priority application Japan, Sep. 14, 1981, 56-145085
Int. Cl.³ B32B *31/02*; B44C *1/04*; C09J *5/00*; G09F *19/00*
U.S. Cl. 156—83 **12 Claims**

1. A process for forming patterns in accordance with transferring operations comprising the steps of forming on the surface of a transfer sheet a water - resistant retention film having there on a layer of a water - resistant printing ink formed into an arbitrary pattern, said retention film having affinity for said printing ink, said transfer sheet comprising a pulpboard sheet; bonding said transfer sheet to the surface of a substrate, with said retention film facing the surface of said substrate; applying a pulp dissolving solution on the pulpboard to dissolve said pulpboard; scraping the pulp of said pulpboard to leave said retention film and said printing ink layer on said substrate; expanding or shrinking at least one member of said substrate and said transfer sheet so as to coincide the pattern so formed on said substrate with the pattern on another transfer sheet; repeating the above described steps to transfer a plurality of printing ink layers on said substrate; and providing a colored film adhering closely to the surface of said printing ink layers thereon after completing the last transferring step.

4,500,375
COLD RECAPPING METHOD FOR TIRES UTILIZING UNCURED RUBBER

Leon C. Goldstein, Atlanta, Ga., assignor to An-Rix, Inc., Atlanta, Ga.

Filed Mar. 24, 1982, Ser. No. 361,403
Int. Cl.³ B29H *17/37, 5/04, 17/36*
U.S. Cl. 156—96 **11 Claims**

1. A cold tire recapping method utilizing uncured rubber and a prepared tire carcass comprising the steps of:

selecting a male mold that has the transverse contour wanted for the tread of the recapped tire and selected sidewall portions for the recapped tire and has the desired design and dimensions therefor,

building up on the male mold tread and selected sidewall portions a first layer of uncured rubber having cross-sectional dimensions appropriate for forming the tread and sidewall portions of the recapped tire,

removing the first layer from the male mold and wrapping the male mold tread and selected sidewall portions with perforated plastic film,

positioning a rectangle of stretchable cloth between the first layer and the film-covered male mold tread, the cloth

dimensioned larger than the desired tread and sidewall portions of the recapped tire such that the longer opposing edges of the cloth fold over the top of the first layer and overlap,

molding the first layer and cloth against the male mold with heat and pressure for a period sufficient to mold and to cure the rubber in the first layer and secure the cloth to the entire surface thereof while simultaneously permitting air trapped between the first layer and the male mold and gases evolved from the first layer during curing to escape through the cloth, the cured first layer and cloth forming a flexible female mold with a cloth surface partially faced with plastic film,

removing the flexible female mold,

coating the buffed surface of the prepared tire carcass with an adhesive cement,

placing a second layer of uncured rubber on the buffed surface of the prepared tire carcass,

placing the female mold around the buffed tire carcass,

placing the tire carcass, cement, second layer, and female mold assembly in a flexible envelope, and

curing the second layer by applying heat and forcing the female mold against the second layer while venting the inner portion of the envelope to atmospheric pressure to allow gases trapped within the envelope to escape.

4,500,376

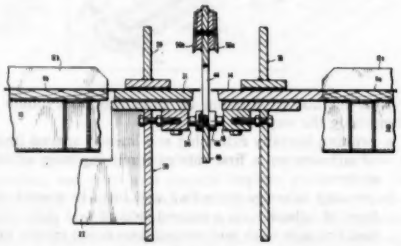
METHOD OF USING A VENEER BUTT-END SPLICER

John DeLigt, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 356,491, Mar. 9, 1982, Pat. No. 4,421,591. This application Jun. 9, 1983, Ser. No. 502,658

Int. Cl.³ B31F *5/00*; G03D *15/04*

U.S. Cl. 156—159 **4 Claims**



1. A method of joining ends of two finite length sheets of material having substantially the same thickness comprising the steps of:

a. longitudinally aligning said two sheets in the same plane with the ends to be jointed positioned over respective cutting edges of separated, parallel bed knives at a first position of separation and under respective cutting edges of a structurally unitized, vertically reciprocable shear knife in a pre-cut position, said bed knife and shear knive cutting edges being below and above each of said two sheets respectfully, and defining respective shear planes;

b. positionally securing said sheets to said bed knives in said alignment;

c. first moving said shear knife cutting edges unidirectionally in said respective shear planes against and through said sheets from said pre-cut position to a post-cut position clear of said sheets and bed knives;

d. while said reciprocable shear knive remains in said post-cut position, moving the cutting edge of one bed knife parallel along said sheet plane from said first separated edge position to a contiguous bed knive edge position in contiguous parallel alignment with the cutting edge of the other bed knife without disturbing the alignment of said sheets relative to said bed knife cutting edges;

e. adhesively applying lap splice material across a joint between said sheared sheet ends;

f. releasing said two sheets from said bed knives;

g. removing said joined sheets from within the two shear planes;

h. returning said bed knife edges from said contiguous edge position to a second separated edge position having a greater separation space than said first separated edge position; and

i. returning said shear knife edges to said pre-cut position.

4,500,377

PROCESS FOR THE PRODUCTION OF A BLOCK OF PIEZOELECTRIC MACROMOLECULAR MATERIAL

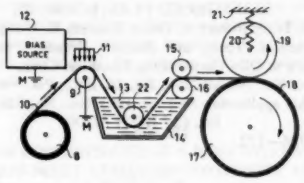
Dominique Broussoux; Hugues Facoetti; Pierre Ravinet; Daniel Bernard, and Francois Micheron, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 27, 1982, Ser. No. 424,292

Claims priority, application France, Dec. 31, 1981, 81 24560

Int. Cl.³ B32B *31/08*

U.S. Cl. 156—164 **21 Claims**



1. Process for the production of blocks of piezoelectric macromolecular material from a thin film utilised as an element of a monolithic multilaminar structure, said process comprising the steps of:

(a) cutting said film into a strip of uniform width;

(b) drawing said strip off a feed reel;

(c) conveying the strip, drawn off said feed reel according to step (b), to a receiving mandrel and rolling the strip onto said receiving mandrel thereby forming a multiturn roll having the said width;

(d) compressing the roll formed at said mandrel according to step (c) at right angles to said turns until a monolithic multilaminar structure is obtained; and

(e) cutting portions from the said roll to thereby form said blocks; wherein between steps (b) and (c) there are sequentially practiced the steps of:

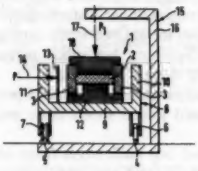
(i) electrically polarizing the strip across its thickness; and

(ii) coating the strip electrically polarized according to step (i) with an adhesive on at least one surface of said strip by contacting said strip with a solution of said adhesive in a solvent.

4,500,378
PROCESS AND AN APPARATUS FOR PRODUCING WOODEN COMPONENTS DESIGNED FOR RESISTING FLEXURAL LOADS

Werner Reppel, Gaggenau, and Claus Overlack, Gernsbach, both of Fed. Rep. of Germany, assignors to Casimir Kast GmbH & Co. KG, Gernsbach, Fed. Rep. of Germany

Filed Apr. 7, 1983, Ser. No. 482,990
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218134
Int. Cl.³ C09J *31/00*; B32B *31/00*; B26D *5/00*
U.S. Cl. 156—160 **6 Claims**



1. A process for producing a wooden structural component having at least a first part and a second part comprising the steps of:

(a) prestressing said first part of the component by a linear force acting in the longitudinal direction thereof, said linear force being a pulling force;

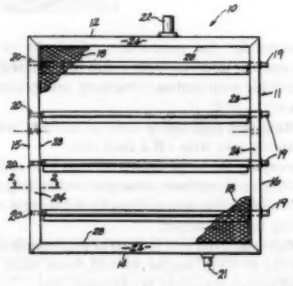
(b) loading said second part of the component with a compressive force; and

(c) bonding said first part to said second part while said first part and said second part of the component are being acted upon by said pulling force and said compressive force to thereby flexually load said component.

4,500,379
METHOD OF MAKING A COMPOSITE FIBER REINFORCED PLASTIC FRAME

James M. Ford; Robert A. Dean; Kenneth E. Woodard, Jr., all of Cleveland, Tenn., and Antonio Branco, Prospect, Ky., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 402,200, Jul. 26, 1982, Pat. No. 4,439,298. This application Aug. 25, 1983, Ser. No. 526,309
Int. Cl.³ B65H *81/00*
U.S. Cl. 156—172 **4 Claims**



1. A method of making a composite reinforced plastic frame for use in a monopolar filter press type of electrolytic cell comprising the steps of:

(a) selecting a corrosion resistant liner of predetermined thickness and composition, the liner further having a first side face, a second opposing generally parallel side face and a third side face interconnecting the first side face and the second side face face to thereby form an open-topped channel of predetermined thickness and height;

(b) fastening at least four predetermined lengths of the liner together at corners to form a generally rectangularly shaped shell frame having a top member, a bottom member, and two opposing side members, the shell frame further having the open-topped channel facing outwardly about the periphery;

(c) mounting the shell frame on a rotatable jig having uniformly spaced side walls and base walls;

(d) impregnating glass fiber roving with a catalyzed thermosetting resin;

(e) winding the impregnated glass fiber roving about the shell frame within the channel in layers while the frame is rotated on the jig;

(f) inserting reinforcing means during winding of the glass fiber roving at each corner of the frame;

(g) applying a predetermined amount of pressure against the impregnated glass fiber roving along the open-topped channel about the periphery;

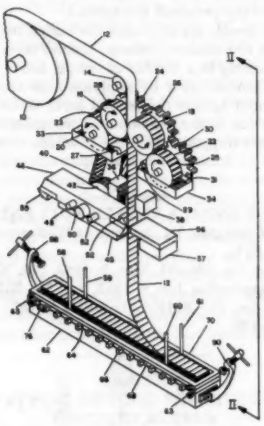
(h) curing the impregnated glass fiber roving; and

(i) removing the frame from the jig.

4,500,380
METHOD AND APPARATUS FOR CONTINUOUS PRODUCTION OF EXPANDABLE HONEYCOMB

Joseph D. Bova, 2104 Harford Rd., Fallston, Md. 21047

Filed Dec. 19, 1983, Ser. No. 563,199
Int. Cl.³ B31D *3/02*
U.S. Cl. 156—197 **14 Claims**



1. A method of forming an expanded honeycomb panel comprising the steps of:

a. printing laterally extending and linearly spaced first lines of adhesive on a first side of a moving strip of narrow material;

b. printing laterally extending and linearly spaced second lines of adhesive on a second side of said strip opposite said first side with said second lines being evenly linearly offset with respect to said first lines;

c. transversely notching said strip in parallel with said lines of adhesive at intervals along its length to form succeeding portions of said strip of a desired length between said notches;

d. fan folding succeeding portions of said strip to form a collapsed panel of said succeeding portions;

e. securing a first of said succeeding portions to a first spreading means and securing a last of said succeeding portions to a second spreading means spaced from said first spreading means;

f. heating said first and last succeeding portions in an amount and for such time sufficient to cure all of said adhesive lines between said succeeding portions of said collapsed panel to bond said succeeding portions to each other in the area of said adhesive lines; and

g. spreading said first and second spreading means apart to expand said collapsed panel to form an expanded honeycomb panel.

4,500,381

METHOD AND APPARATUS FOR MAKING MULTIPLE PLY PAPERBOARD

Duane M. Nordstrom, Kelso, Wash., assignor to Longview Fibre Company, Longview, Wash.

Filed Apr. 20, 1983, Ser. No. 486,788

Int. Cl.³ B31F *1/20*; B32B *31/12*

U.S. Cl. 156—205 **17 Claims**

1. A method of making multiple ply paperboard comprising applying glue to a surface of predetermined ones of paperboard sheets as they move between a cut-off section and a stacker section of paperboard making apparatus, and stacking the paperboard sheets one upon another at the stacker section and allowing the glue to bond the associated group of paperboard sheets together throughout substantially their entire areas.

4,500,382

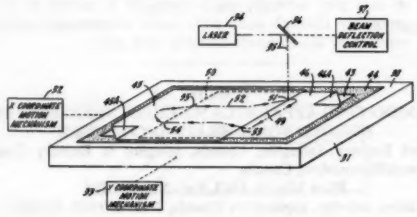
METHOD OF MANUFACTURE OF RESIN FILM PRECISION BIOMEDICAL ARTICLE

William J. Foster, Chicago, Ill., assignor to Transilwrap Company, Inc., Chicago, Ill.

Filed Jun. 10, 1983, Ser. No. 503,347

Int. Cl.³ B29C *19/02*

U.S. Cl. 156—272.8 **9 Claims**



1. The method of manufacture of a precision article for biomedical use, such as a corneal implant glide, of the kind comprising first and second overlapping resin film members, each having a preselected thickness and a precise predetermined size and configuration, with the overlapping portions of the two resin film members corresponding in size and configuration and joined together along one or more mating edges, comprising the following steps:

A. aligning a first resin film, having a thickness corresponding to that required for the first film member but larger in area than the first film member, in at least partially overlapping relation to a second resin film, having a thickness corresponding to that required for the second film member but larger in area than the second film member, the overlapping portions of the two films being larger in area than the overlapping portions of the resin film members of the article;

B. constraining the two resin films to maintain areas of the two aligned films larger than the finished article in essentially flat, surface-to-surface contact, exposed from one side;

C. directing a laser beam having a maximum cross-sectional dimension no larger than the combined thicknesses of the two resin films, to impinge upon the exposed area of the aligned, constrained films; and

D. moving the laser beam relative to the exposed areas of the aligned, constrained films, along a predetermined path corresponding precisely to the size and configuration of the peripheral outline of the finished article to cut the two resin film members from the resin films and simultaneously to weld the resin film members together, in a narrow, controlled band not appreciably wider than the combined thicknesses of the two resin films, along their mating edges.

4,500,383

PROCESS FOR BONDING COPPER OR COPPER-CHROMIUM ALLOY TO CERAMICS, AND BONDED ARTICLES OF CERAMICS AND COPPER OR COPPER-CHROMIUM ALLOY

Yoshiyuki Kashiwagi, and Tsutai Suzuki, both of Shinagawa, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Feb. 8, 1983, Ser. No. 465,043

Claims priority, application Japan, Feb. 18, 1982, 57-24758; Mar. 4, 1982, 57-34247

Int. Cl.³ B29C *17/00*

U.S. Cl. 156—285 **13 Claims**

1. A process for bonding a copper body and a ceramic body to each other, said ceramic body having a melting point higher than that of copper, said process comprising the steps of:

directly sandwiching a layer of chromium oxide between the copper and ceramic bodies;

heating a temporary assembly of the ceramic and copper bodies and the chromium oxide in an atmosphere in which copper will not oxidize, at a temperature of at least 900° C. but below the melting point of copper; and then

slowly cooling the resulting bonded assembly in which a bonded portion of the copper body is plastically deformed.

4,500,384

PROCESS FOR PRODUCING A NON-WOVEN FABRIC OF HOT-MELT-ADHERED COMPOSITE FIBERS

Susumu Tomioka, and Masahiko Taniguchi, both of Shigaken, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Feb. 2, 1983, Ser. No. 463,074

Claims priority, application Japan, Feb. 5, 1982, 57-17126

Int. Cl.³ D02G *3/00*; D04H *1/54, 1/56*; B32B *27/02*

U.S. Cl. 156—290 **5 Claims**

1. A process for producing a soft and light-weight nonwoven faric of hot melt adhered fibers, which mainly comprises:

(A) forming a web of fiber aggregate consisting of:

(1) sheath-and-core composite fibers alone

the core component of said composite fibers being a fiber-formable polymer,

the sheath component having an average thickness of 1–4 microns comprising at least one polymer having a melting point at least 30° C. lower than that of said core component, or

(2) mixed fibers of said sheath-and-core composite fibers with other fibers containing said composite fibers in an amount of at least 20% by weight based on the total amount of said mixed fibers,

(B) imparting crimps to the sheath-and-core type composite fibers, and

(C) subjecting said web of fiber aggregate to a heat treatment at a temperature which is lower than the melting point of said core component and equal to or higher than the melting point of said sheath component, and which affords to said sheath component an apparent viscosity of 1×10^3 to 5×10^4 poises as measured at a shear rate of 10 to 100 sec^{-1}, to thereby stabilize the form of said web of fiber aggregate by way of the hot-melt adhesion of said sheath component.

4,500,385

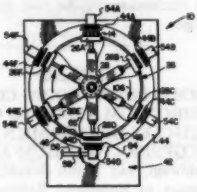
LUMBER ASSEMBLY MACHINE

Dennis H. Waggoner, 11960 Forestwood Dr., Dallas, Tex. 75234

Filed Apr. 6, 1984, Ser. No. 597,712

Int. Cl.³ B32B *19/02, 31/00;* **B31F** *5/00;* **B65H** *29/00*

U.S. Cl. 156—380.4 **2 Claims**



1. Apparatus for curing adhesive applied to the union of two boards of lumber mated end-to-end in a finger joint union comprising, in combination:

a stator assembly having an opening for receiving a rotor, said stator also having a plurality of electrode plates disposed at spaced locations around said opening thereby defining a plurality of curing stations;

a rotor assembly having a plurality of electrode plates disposed at angularly spaced locations within said stator opening in axial alignment with said stator electrode plates, the number and spacing of said rotor electrode plates corresponding with the nunber and spacing of said stator electrode plates; means for moving the plurality of stator electrode plates into compressive engagement with the finger joint union of two boards disposed intermediate said rotor stator electrode plates at each curing station when said rotor electrode plates are in radial alignment with said stator electrode plates, all of said rotor and stator electrode plates being adapted to conduct electrical current through said finger joint union.

4,500,386

CONTAINER FEED FOR LABELING MACHINE

Wolfgang Hoffman, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Continuation of Ser. No. 783,285, Mar. 31, 1977, abandoned. This application Apr. 18, 1983, Ser. No. 485,754

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—449 **4 Claims**

1. Labeling apparatus comprising:

(a) a cylindrical rotary label transport and a rotary container transport-label applicator rotating about parallel axes

(b) means for rotating such label transport and container transport-label applicator in opposite directions about their parallel axes

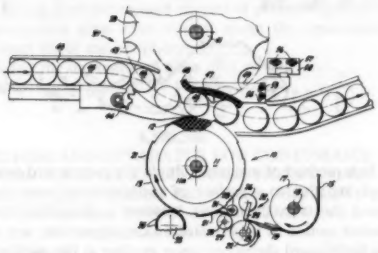
said label transport being adapted, as it rotates, to pick up labels at a label pick up station, to transport each label on its cylindrical surface and to release each label at a label applying station

said container transport-label applicator having angularly spaced, peripheral pockets each adapted to cradle a cylindrical container with its cylinder axis parallel to the axis of the label transport and the axis of the container transport-label applicator, the outermost surface of each cradled container, as it rotates about the axis of the container transport-label applicator, describing a segment of a cylinder which is concentric to the axis of the container transport-label applicator

said label transport and container transport-label applicator being spaced apart by a gap such that each container, as it passes into such gap, is tangent to the label transport

(c) an upstream container guide disposed with its downstream terminus substantially tangent to said label transport, such upstream guide acting to hold each cradled container in its pocket until said container reaches such gap, is tangent to the label transport and picks up and adheres to the leading edge of the label at the labeling station and

(d) a downstream container guide and label applicator concentric to the axis of the label transport, such guide and applicator being spaced from the label transport and located so that it will extract each container, in turn, from its pocket with the leading end of a label attached to its surface and will roll the container on the label transport to wrap the respective label about it;



such upstream container guide, container transport-label applicator, downstream container guide and label transport causing each container to traverse an S-shaped path, the initial part of which is formed by the upstream guide and container transport-label applicator and is concave to the container transport-label applicator, the terminal part of such path is formed by the downstream guide and label transport and is concave to the label transport and the portion of such path at the inflection of the S being located at said gap, whereby each container is caused to pass smoothly through such path under continuous positive control by the elements forming such path.

4,500,387

LAMINATING APPARATUS WHEREIN SHEETS TO BE BONDED FORM HEATING CHAMBER

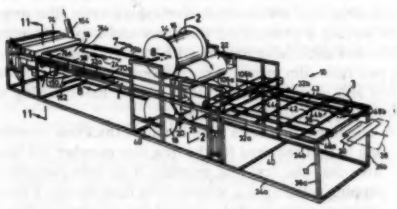
Lloyd Embury, Islington, Canada, assignor to Embury Company, Downsview, Canada

Filed May 6, 1983, Ser. No. 492,316

Claims priority, application Canada, Feb. 8, 1983, 421096

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—499 **8 Claims**



1. A laminating machine for laminating two outer sheets to

an inner sheet, all said sheets having the same width, said machine comprising:

(1) means for supporting said outer sheets in spaced apart parallel opposed relation with the side edges of said outer sheets aligned, for travel of said outer sheets together along a direction of travel;

(2) means for supporting said inner sheet between and spaced from said outer sheets and parallel thereto with the side edges of said inner sheet aligned with those of said outer sheet, for travel of said inner sheet along said direction of travel;

(3) motive means for moving all three said sheets in unison along said direction of travel;

(4) side cover means enclosing said side edges of said three sheets to form a chamber, the top and bottom walls of said chamber being constituted by such moving outer sheets;

(5) means for applying a solvent-containing contact adhesive to said sheets to coat at least some of the opposed surfaces of said sheets for said sheets to be adhered together;

(6) means for providing heat within said chamber to dry said adhesive;

(7) means for exhausting solvent laden air from said chamber, and

(8) means to pinch said outer sheets together onto said inner sheet to secure said sheets together.

4,500,388

METHOD FOR FORMING MONOCRYSTALLINE SEMICONDUCTOR FILM ON INSULATING FILM

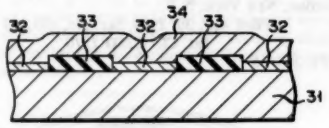
Yamichi Ohmura, Sagamihara, and Yoshiaki Matsushita, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 29, 1982, Ser. No. 445,265

Claims priority, application Japan, Nov. 30, 1981, 56-190628

Int. Cl.³ C30B 1/04

U.S. Cl. 156—603 **12 Claims**



1. A method for forming a monocrystalline semiconductor film on an insulating film, comprising the steps of:

selectively forming at least one insulating film which has sides substantially perpendicular to <100> or <211>-axes, contiguous to a cubic crystal system monocrystalline semiconductor substrate;

forming an amorphous film of a cubic crystal system semiconductor material to cover an exposed surface of said substrate and said insulating film; and

annealing said amorphous semiconductor film under a condition such that said amorphous film is grown from said substrate by solid-phase epitaxial growth, thereby converting said amorphous film to a monocrystalline semiconductor film having a crystal lattice continuous to that of said substrate.

4,500,389

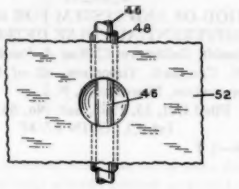
PROCESS FOR THE MANUFACTURE OF SUBSTRATES TO INTERCONNECT ELECTRONIC COMPONENTS

Charles L. Lassen, Cold Spring Harbor, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Apr. 14, 1981, Ser. No. 254,132

Int. Cl.³ B44C 1/22

U.S. Cl. 156—643 **32 Claims**



1. A process for providing substrates on which to mount and interconnect high density components, the steps comprising:

(a) applying and affixing filaments in a preprogrammed pattern to a base, said filaments baving at least one conductive portion;

(b) applying a substantially smooth, flat planar coating over said filaments and said base for the purpose of maintaining the position of the filaments and for providing a surface suitable for mounting surface-mounted components;

(c) at desired locations on said planar surface, forming at least one cavity, penetrating said coating and substantially exposing the conductive portion of said filaments while maintaining the integrity of said filaments; and

(d) providing an interfacing means between said exposed conductive portion of the filaments and the external surface of said planar coating.

21. A process, as recited in claim 1, in which said penetration is achieved with a high energy beam.

4,500,390

ELASTIC SCRAPER FOR HIGH-CAPACITY FILM DEVICE

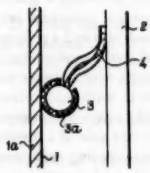
Alexander Tkac, and Jan Cvengros, both of Bratislava, Czechoslovakia, assignors to Slovenska vysoka skola technika, Bratislava, Czechoslovakia

Continuation-in-part of Ser. No. 266,761, Jan. 22, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,120

Claims priority, application Czechoslovakia, Feb. 4, 1980, 721-80

Int. Cl.³ B01D 1/22

U.S. Cl. 159—6.1 **10 Claims**



1. An elastic scraper for a high-capacity film device having a liquid heating means in the form of a shell with a circular cross-section, said shell having a circular cylindrical heating surface on which there is formed a liquid film which is wiped by said scraper, the scraper comprising a plurality of supporting rods with wiper segments mounted thereon, the wiping segments being held from above on their respective supporting rod, an elastic coupling connected at its upper end to the

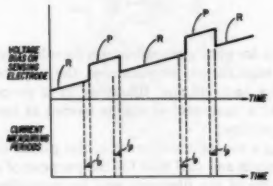
supporting rod and at its lower end to the wiping segment and means for mounting said scraper in said high-capacity film device.

4,500,391

METHOD OF AND SYSTEM FOR REAL TIME DIFFERENTIAL PULSE DETECTION

John C. Schmidt, Baltimore; Clifton A. Sands, Oxon Hill, and Donald N. Campbell, Timonium, all of Md., assignors to Allied Corporation, Morristown, N.J.

Filed Oct. 13, 1983, Ser. No. 541,631
Int. Cl.[3] G01N *27/48*
U.S. Cl. 204—1 T 24 Claims



1. A system for detecting a gas in an environment comprising an electrochemical detection cell having a reference electrode, a counter electrode and a sensing electrode; said reference electrode and said counter electrode spaced apart from each other and from said sensing electrode, an electrolyte in contact with said reference electrode, counter electrode and sensing electrode, a membrane having a first surface exposed to said environment for passing said gas in said environment through said membrane to said sensing electrode, an operational amplifier having an output terminal, an inverting input terminal and a non-inverting input terminal, said output terminal being coupled to said counter electrode, said reference electrode being coupled to one of said input terminals; means for applying a fixed D.C. voltage bias to the other of said input terminals; means for applying at least one differential D.C. voltage pulse to said other input terminal to superimpose same on said fixed D.C. voltage bias to provide a corresponding differential D.C. voltage pulse on its output terminal, and means coupled to said sensing electrode and responsive to current therefrom for determining difference in Faradaic currents produced during a period before application of the differential D.C. voltage pulse and a period before termination thereof as an indication of presence of a given gas.

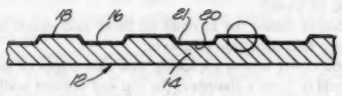
23. A method for detecting a gaseous agent in an ambient with an electrochemical detection cell having a sensing electrode, a counter electrode and a reference electrode, said reference electrode and said counter electrode spaced apart from each other and from said sensing electrode and having an electrolyte in contact with said reference electrode, counter electrode and sensing electrode, comprising the steps of exposing said ambient to one side of a membrane capable of passing said gaseous agent, exposing said sensing electrode with the gas passing through said membrane, applying a fixed D.C. voltage bias to the counter electrode for supplying electrical current through said electrolyte to said sensing electrode to maintain a predetermined potential at said reference electrode, superimposing at least one differential D.C. voltage pulse on the fixed D.C. voltage bias and determining the difference between Faradaic signals produced from the sensing electrode during a period before superimposing the differential D.C. voltage pulse and in a period before termination of the differential D.C. voltage pulse.

4,500,392

STAMPER AND METHOD FOR INJECTION MOLDING INFORMATION BEARING MEMBER

Gary G. Slaten, Tucson, Ariz., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 505,565, Jun. 17, 1983,. This application May 16, 1984, Ser. No. 611,049
Int. Cl.[3] C25D *1/10, 1/20*
U.S. Cl. 204—5 8 Claims



1. A method for producing an improved metallic stamper against which an optically-readable information bearing member may be formed, comprising the steps of:

preparing an information bearing surface on a substrate having the information contained therein in the form of surface discontinuities;

vacuum depositing a conductive coating over the information bearing surface of the substrate of sufficient thickness to be conductive over the entire information bearing surface;

electroplating nickel material onto said conductive coating, thereby forming a relatively thick nickel stamper base having an information bearing surface complementary to that of said substrate;

separating the nickel stamper from the substrate; and

depositing, by electroplating in an electrolyte bath, a relatively thin layer of chromium over said complimentary information bearing surface of said stamper base, said depositing step including the steps of:

maintaining the electrolyte bath temperature at 40° C. to 50° C.;

establishing a current density within the electroplating bath in the range of 0.250 to 2.00 amps/cm^2; and

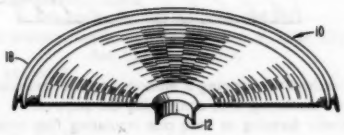
performing said depositing step for a time in the range of 10 to 40 seconds.

4,500,393

METHOD FOR THE MANUFACTURE OF RECORD STAMPERS

Donald J. Wierschke, Brownsburg, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,240
Int. Cl.[3] C25D *1/10*
U.S. Cl. 204—5 6 Claims



1. The method for the manufacture of a record stamper having a formed inner edge of a first predetermined configuration, a recorded section having a negative copy on an information track defined therein, and a formed outer edge of a second predetermined configuration; said method comprising the sequential the steps of: forming a matrix having a flat inner section, a recorded portion having positive copy of the information track defined therein, and a flat outer section; shaping the flat inner section into a form which is a mirror image of the first predetermined configuration; shaping the flat outer section into a form which is the mirror image of the second prede-

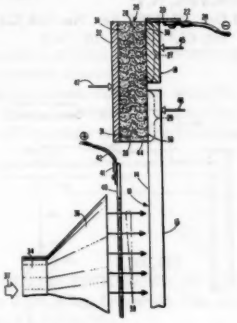
termined configuration; after the inner and outer sections of the matrix are shaped, electroforming a metal on the matrix in a preselected thickness required for the stamper; and separating the resulting stamper from the matrix, whereby a stamper is obtained having electroformed inner and outer edges of the predetermined configurations.

4,500,394

CONTACTING A SURFACE FOR PLATING THEREON

John S. Rizzo, Birdsboro, Pa., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed May 16, 1984, Ser. No. 610,737
Int. Cl.³ C25D *5/02, 17/08*
U.S. Cl. 204—15 **12 Claims**



1. Apparatus for plating on a first surface of an article comprising:

a conductor disposed adjacent to the first surface and means for connecting said conductor to a source of electrical current;

means for contacting the conductor and the first surface, including a first portion in contact with the conductor and a second portion in contact with the first surface, each of said portions having a substantially nonconductive matrix supporting a plurality of conductive elements having first and second ends, said first ends of elements in the first portion being in contact with the conductor and said first ends of elements in the second portion being in contact with the first surface; and

at least one coupling member in contact with and interconnecting the second ends of the conductive elements in the first and second portions of the contact means thereby completing conductive paths from the conductor through the elements of the first portion to the coupling member and therefrom through the elements of the second portion to the first surface.

4,500,395

METHOD OF PRODUCING ELECTRODE FOR LIQUID FUEL CELL

Masashi Nakamura, Miura, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

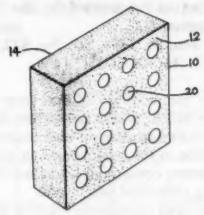
Filed May 2, 1983, Ser. No. 490,955
Claims priority, application Japan, Nov. 5, 1982, 57-193318
Int. Cl.³ B01J *23/38, 35/02*
U.S. Cl. 204—284 **11 Claims**

1. A method of producing an electrode for a liquid fuel cell, comprising the steps of:

(a) depositing a noble metal onto a porous electrode body comprising carbon to coat and impregnate said electrode body with said noble metal;

(b) immersing said electrode body coated and impregnated with said noble metal in a solution containing ions of a base metal for at least 5 minutes to sufficiently diffuse said solution into the pores in said electrode body;

(c) after step (b) activating said noble metal deposited on said electrode body by changing the arrangement of the atoms of said noble metal on the surface of said electrode body to an unstable state; and



(d) thereafter depositing said base metal onto the surface of said electrode body already coated with said noble metal while said noble metal remains in the activated state.

4,500,396

COPPER RECOVERY PROCESS

Vincent F. D'Agostino, 4 Greenland Dr., Huntington Station, N.Y. 11746; Joseph Y. Lee, 911 Hawkins Ave., Lake Grove, N.Y. 11755; Stephen Zapisek, 12 Vandorn St., Huntington Station, N.Y. 11746, and George Schore, 45 Hillpark Ave., Great Neck, N.Y. 11021

Filed Jan. 26, 1984, Ser. No. 574,048
Int. Cl.³ C25C *1/12*
U.S. Cl. 204—107 **24 Claims**

1. A method of metal recovery comprising;

(a) forming a weakly-acidic cation-exchange material by radiation-grafting vinylic or ethylenic monomers comprising carboxylic acid functional groups to a polymeric felt substrate to the extent of 10–1500%;

(b) converting the carboxylic acid groups to the corresponding carboxylate salt groups; and

(c) contacting the cation-exchange material with an alkaline aqueous solution comprising ammoniated metal cations so as to form a complex between the cations and the carboxylate groups, thereby removing the cations from solution.

4,500,397

METHOD FOR THE PREPARATION OF A PYROELECTRIC MATERIAL

Toshio Mori, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP82/00290, § 371 Date Mar. 24, 1983, § 102(e) Date Mar. 24, 1983, PCT Pub. No. WO83/00404, PCT Pub. Date Feb. 3, 1983
PCT Filed Jul. 27, 1982, Ser. No. 478,556
Claims priority, application Japan, Jul. 27, 1981, 56-117551; Jul. 29, 1981, 56-117806; Jul. 29, 1981, 56-117807
Int. Cl.³ C25D *13/02, 13/20*
U.S. Cl. 204—181 T **14 Claims**

13. A method for the preparation of a complex pyroelectric structure comprising:

dispersing crystalline pyroelectric particles between an opposing pair of electrodes,

establishing an electric field between said electrodes with a sufficient magnitude to cause said particles in the dispersion to be deposited in a layer on one of said electrodes,

changing the temperature of said particles before deposition of said particles on said one electrode, the temperature change being sufficient to orient the pyroelectric axes of the crystal particles in the deposited layer and

impregnating binder material into the layer of the pyroelectric structure thus produced.

4,500,398

PRODUCTION OF LEAD FROM SULFIDES

Ernest R. Cole, Jr., Newburg; Agnes Y. Lee, and Danton L. Paulson, both of Rolla, all of Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 20, 1984, Ser. No. 622,515
Int. Cl.³ C25C 1/18
U.S. Cl. 204—117 9 Claims

1. A method for the recovery of lead from sources of lead which also contain sulfur, which comprises the steps of:

(a) reacting the sulfur-containing lead source with a fluosilicic acid solution in the presence of an oxidizing agent to produce a solution containing lead fluosilicate and a residue containing elemental sulfur; and

(b) subjecting the lead fluosilicate solution to electrolysis to produce lead and fluosilicic acid.

4,500,399

METHOD OF PRODUCING METAL-FILLED ORGANIC COATING

Robert G. Hart, Bethlehem, and Herbert E. Townsend, Center Valley, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Sep. 20, 1983, Ser. No. 534,010
Int. Cl.³ C25D 13/20, 13/04
U.S. Cl. 204—181 C 9 Claims

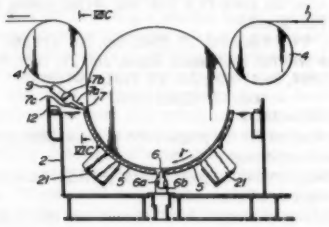
1. In a method of electrophoretically coating a weldable composite ferrous substrate which includes the steps of selecting a ferrous substrate whose surface has been suitably cleaned of grease and oxides, applying to such surface an organic coating having dispersed therein a particulate metal, which coating has been applied to a depth of between about 0.5 to 1.0 mil, and curing such metal-filled organic coating through heating and quenching, the improvement comprising in combination therewith the steps of selecting said particulate metal from the group consisting of Al, Ni, Cr, Fe, Mn, Cu, Mo, Co, Ag, Au and alloys thereof and subjecting the thus coated product to cathodic electrophoretic coating at an applied voltage of at least 300 V.

4,500,400

COUNTER FLOW DEVICE FOR ELECTROPLATING APPARATUS

Akira Komoda; Yasuhiro Hirooka; Takahisa Yoshihara, and Akira Matsuda, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jul. 3, 1984, Ser. No. 627,394
Claims priority, application Japan, Oct. 7, 1983, 58-186883
Int. Cl.³ C25D 17/00
U.S. Cl. 204—206 9 Claims



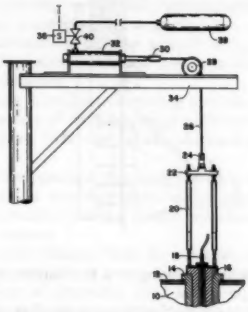
1. A counter flow device for a plating apparatus including a rotary drum with its substantially half part immersed in a plating solution in a plating bath about said drum a metallic strip to be plated passing in synchronism with rotation of said rotary drum and anodes spaced apart by radial gaps from the strip for causing electric current to flow between said strip and the anodes, said device comprising a bottom nozzle arranged at a bottom of the bath and having a nozzle opening directing in a direction substantially opposite to an entering direction of said strip thereat and a top nozzle having a nozzle opening whose tip end is immersed in the proximity of a surface of said plating solution at a location where the strip leaves the plating solution.

4,500,401

ANODE RETRACTION DEVICE FOR A HALL-HEROULT CELL EQUIPPED WITH INERT ANODES

James M. Clark, Johnson City; Duane R. Secrist, Elizabethton; Scotty L. Hardin, Elizabethton, and Stephen C. McEntyre, Elizabethton, all of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,925
Int. Cl.³ C25C 3/10, 7/06
U.S. Cl. 204—225 3 Claims



1. A device for the automatic partial or complete retraction of an inert anode from the bath in a Hall-Heroult cell when electrical power to said cell is interrupted comprising, in combination, a compressed air reserve power source mechanically linked remotely to the anode by a pneumatic actuator which is controlled by electrical power interruption sensing means, said sensing means comprising a direct current solenoid operated valve which during normal operation is energized to the closed position by a D.C. power supply and following a power failure is energized by a battery operated circuit which contains a mechanical or electrical time delay mechanism, said time delay mechanism set to open the solenoid valve a predetermined period after electrical power is interrupted to said cell, admitting air to said actuator from said power source to retract said anode.

4,500,402

REFERENCE ELECTRODE

Ronald C. Miles, Cleveland; George W. Geren, Georgetown, and R. W. Peel, Tellico Plains, all of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Apr. 29, 1982, Ser. No. 373,204
The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.
Int. Cl.³ G01N 27/30
U.S. Cl. 204—242 44 Claims

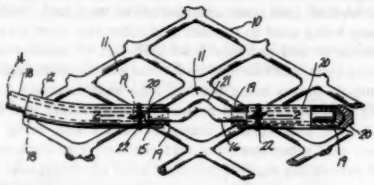
1. An electrolytic cell having a wire reference electrode immersed in an electrolyte solution for use in the electrolytic cell, the cell having at least a first foraminous cathode surface with foramens of a predetermined height and a second foraminous anode surface with foramens of a predetermined height separated by an ion-selective permeable separator, the combination comprising:

a. a lead-in wire of predetermined size and composition, the lead-in wire being connectable to a voltmeter;

b. a reference wire portion connected to the lead-in wire at

a first location, the reference wire portion being of a predetermined size and composition and extending along and at least partially into a foramen;

c. sealing means for sealing the lead-in wire, the first location



and at least a portion of the reference wire portion from the electrolyte solution; and

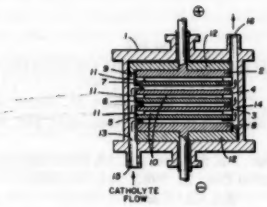
d. heat shrink means collapsed about the sealing means to cover at least a portion of the sealing means when subjected to a predetermined level and manner of heating.

4,500,403

DIVIDED ELECTROCHEMICAL CELL ASSEMBLY

Christopher J. H. King, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 8, 1983, Ser. No. 511,810
Int. Cl.³ C25B *9/00, 11/02*
U.S. Cl. 204—255 **4 Claims**



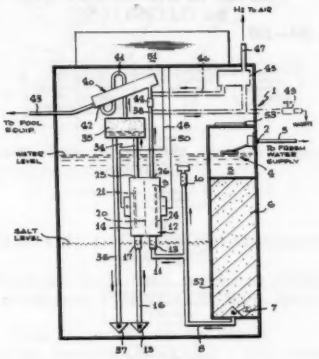
1. A divided electrochemical cell assembly comprising an essentially cylindrical electrolytic chamber having interior periferal walls, a plurality of stacked bipolar substantially square parallel planar electrodes and membranes so arranged within the chamber that each pair of one electrode and one adjacent membrane defines an electrolyte channel with alternating channels being anolyte channels and alternating channels being catholyte channels and that the corners and edges of the electrodes and membranes in juxtaposition with the interior periferal walls of the chamber define four electrolyte circulating manifolds, means for applying a direct current across the stack of electrodes, means for introducing catholyte at one side of the cylinder and into one of the manifolds, means for withdrawing the catholyte from one other manifold, means for exiting the catholyte at the opposite side of the cylinder from the catholyte introduction, and channeling and insulative spacer means comprising at least two spacers between and along the edges of each catholyte channel; means for introducing anolyte at another side of the cylinder and into another of said manifolds, means for withdrawing anolyte from another manifold, means for exiting anolyte at the opposite side of the cylinder from the anolyte introduction and channeling and insulative spacer means comprising at least two spacers between and along the edges of each anolyte channel.

4,500,404

CHLORINE GENERATOR DEVICE

Daniel Tucker, 1981 Chateau Ct., Walnut Creek, Calif. 94598

Filed Dec. 21, 1981, Ser. No. 332,957
Int. Cl.³ C25G *1/34, 15/02*
U.S. Cl. 204—266 **3 Claims**



1. A chlorine generating device comprising;

a tank containing a saturated solution of sodium chloride; an electrolytic cell submerged therein;

said cell containing an ion selective membrane separating anode and cathode compartments such that a brine solution is present only on said anode compartment of said cell;

a water softening means to supply hardness free water to make up said brine solution as well as to be directly supplied to said cathode compartment of said cell; and

a source of direct current, the positive output thereof connected to an anode electrode of said cell and the negative output to a cathode electrode of said cell.

4,500,405

CATHODE FOR ELECTROLYZING ACID SOLUTIONS AND PROCESS FOR PRODUCING THE SAME

Hisoshi Asano, Chiba; Takayuki Shimamune, Tokyo; Toshiki Goto, and Masashi Hosonuma, both of Kanagawa, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Continuation of Ser. No. 416,512, Sep. 9, 1982, abandoned. This application Jan. 9, 1984, Ser. No. 568,515
Claims priority, application Japan, Sep. 22, 1981, 56-148698
Int. Cl.³ C25B *11/10*
U.S. Cl. 204—290 F **8 Claims**

1. A cathode for electrolyzing acid solutions which comprises

an electrically conductive metal substrate,

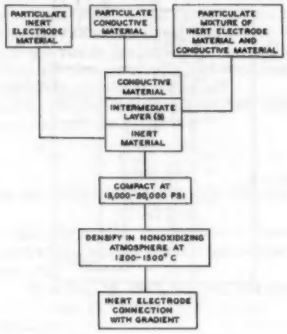
a spray coated layer of a cathode active material containing tungsten, tungsten carbide or a mixture thereof in an amount of 10% by weight or more on said substrate, and

an impregnation coated layer of 1 g/m^2 or more of an acid-resistant fluorine containing resin on the outside surface of said spray coated layer of cathode active material wherein portions of said cathode active material are left exposed.

4,500,406
INERT ELECTRODE CONNECTION

John D. Weyand, Greensburg; Robert W. Woods, New Kensington; David H. DeYoung, and Siba P. Ray, both of Plum Boro, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 12, 1983, Ser. No. 560,602
Int. Cl.³ C25B *11/04*
U.S. Cl. 204—293 17 Claims

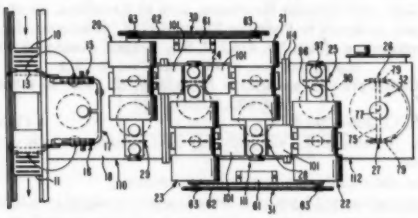

PARTICULATE INERT ELECTRODE MATERIAL
PARTICULATE CONDUCTIVE MATERIAL
PARTICULATE MIXTURE OF INERT ELECTRODE MATERIAL AND CONDUCTIVE MATERIAL
CONDUCTIVE MATERIAL
INTERMEDIATE LAYER (S)
INERT MATERIAL
COMPACT AT 15,000–20,000 PSI
DENSIFY IN NONOXIDIZING ATMOSPHERE AT 1200–1500° C
INERT ELECTRODE CONNECTION WITH GRADIENT

1. An inert electrode suitable for use in an electrolytic reduction cell for the production of aluminum characterized by good electrical conductivity and substantial inertness to the electrolyte in the molten salt bath comprising an interwoven network of a nickel-iron alloy and at least one nickel-iron oxide and having an electrical-mechanical connection thereto capable of carrying electrical current between said electrode and a source of current; said electrical-mechanical connection comprising a first portion consisting essentially of said inert electrode material, a second portion comprising a conductive metal material selected from the class consisting of nickel and nickel-iron alloys, and at least one region therebetween comprising an electrically conductive gradient of said inert electrode material and said conductive metal material whereby a continuous conductive path of nickel/nickel-iron material will extend from said conductive metal into said molten salt bath while said oxides dispersed throughout the inert electrode will provide sufficient inertness to protect the conductive portions.

4,500,407
DISK OR WAFER HANDLING AND COATING SYSTEM

Donald R. Boys, Cupertino, and Walter E. Graves, San Jose, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 19, 1983, Ser. No. 515,247
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 43 Claims

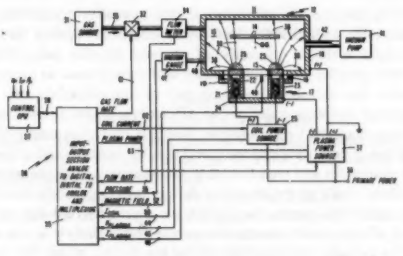


1. A system for handling and individually processing a plurality of relatively thin substrates, said substrates being vertically oriented during said handling and processing, said system comprising a main chamber, an entrance load lock and an exit load lock, a plurality of processing stations, load lock load/unload means, vertical transport means, and horizontal transport means, said load locks being positioned above said main chamber and sealed to a top wall thereof, said processing stations being disposed between said load locks and also sealed to said top wall of said main chamber, said load lock load/unload means being used to transfer said substrates from an entrance cassette to said entrance load lock and to transfer said substrates from said exit load lock to an exit cassette, said vertical transport means being used to raise said substrate from said main chamber into said processing stations and into said exit load lock, said vertical transport means also being used to lower said substrates from said entrance load lock and from said processing stations into said main chamber, said vertical transport means including a plurality of individual lift blades, each of said load locks and processing stations being served by a dedicated one of said lift blades, each of said lift blades being configured to securely hold an individual one of said substances during vertical transport, said lift blades for said processing stations being configured to hold said substrates during processing in said processing stations, said horizontal transport means being used to effect simultaneous one-station shifts of all said substrates within said main chamber, said shifts being directed toward said exit load lock; whereby said individual substrates are transported through said system, being processed sequentially in successive ones of said processing stations, all of said processing stations simultaneously processing one of said substrates, thereby allowing a high rate of production to be achieved.

4,500,408
APPARATUS FOR AND METHOD OF CONTROLLING SPUTTER COATING

Donald R. Boys, Cupertino, and Robert M. Smith, San Jose, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 515,246, Jul. 19, 1983, abandoned. This application Dec. 27, 1983, Ser. No. 564,776
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 58 Claims

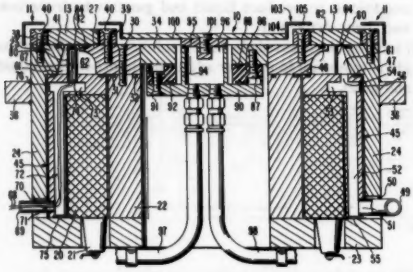


1. A method of controlling a sputter coating depositing apparatus including a target cathode, an anode and a plasma, ionizing electrons for the plasma having a tendency to be confined in proximity to an emitting surface of the target by a magnetic field having lines of flux adjacent the emitting surface of the target, the confining magnetic field intersecting electric field lines extending between the anode and cathode, the methode comprising controlling the electric impedance of the plasma by controlling the magnetic field intensity in response to a plasma parameter having a tendency to vary.

4,500,409
MAGNETRON SPUTTER COATING SOURCE FOR BOTH MAGNETIC AND NON MAGNETIC TARGET MATERIALS

Donald R. Boys, Cupertino, and Walter E. Graves, San Jose, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 515,093, Jul. 19, 1983, abandoned. This application Dec. 27, 1983, Ser. No. 564,777
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **73 Claims**



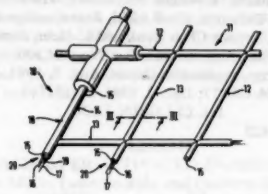
1. A magnetron sputter coating source comprising an anode, a cathode means including means for mounting a magnetic sputter target, and a magnetic field means including an electromagnet coil, a yoke, and a pair of polepieces separated by a spatial gap and joined to said yoke, said yoke and polepieces being made of materials of high magnetic permeability and high saturation magnetization, said magnetic sputter target being mounted so as to be positioned atop said polepieces, said gap and magnetic sputter target being configured and positioned so the target completely bridges said spatial gap, whereby a continuous magnetic path between said polepieces is provided through said target, an electric current flowing in said electromagnet coil causing magnetic field lines to be established in said yoke, polepieces, and magnetic sputter target, said coil current having a critical value, substantially all of said magnetic field lines being confined to the interior of said yoke, polepieces, and magnetic sputter target when said coil current is less than said critical value, a magnetically saturated portion of said magnetic sputter target occurring when said coil current is greater than said critical value, whereby a magnetic gap is established in said magnetic sputter target, said magnetic gap allowing fringing magnetic field lines to be established above and below said magnetic sputter target in the vicinity of said magnetic gap, said coil current having a required value, said required value being sufficiently greater than said critical value that said fringing magnetic field lines above said magnetic sputter target having required intensities may be established, thereby allowing a magnetically confined and magnetically enhanced glow discharge to be established above said magnetic sputter target in a region adjacent said magnetic gap.

4,500,410
REINFORCING OR CARRIER ELEMENT FOR STRUCTURAL MATERIAL

Hans Oppitz, Mils, Austria, assignor to Eltac Nogler & Daum KG, Innsbruck, Austria

Filed Aug. 8, 1983, Ser. No. 521,190
Claims priority, application Austria, Aug. 16, 1982, 3101/82
Int. Cl.³ B01D *13/02*; C25B *11/00*
U.S. Cl. 204—299 R **19 Claims**

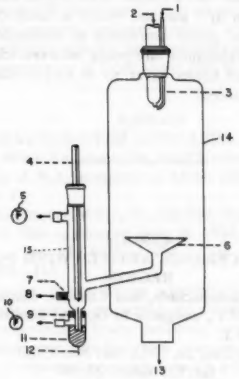
1. An electrically conductive reinforcing or carrier element for structural material, comprising a carrier body constituted by a flexible net comprised of strands having a surface of a conductive synthetic resin in contact with the structural material, the strands of the net including conductive filamentary carrier materials incorporated therein.



4,500,411
AUTOMATICALLY OPERATED POLAROGRAPHIC ANALYZER

Chaim N. Yarnitzky, Haifa, Israel, assignor to Technion Research & Development Foundation Ltd., Haifa, Israel, a part interest

Filed Jun. 1, 1983, Ser. No. 500,098
Claims priority, application Israel, Aug. 1, 1982, 66438
Int. Cl.³ G01N *27/34*
U.S. Cl. 204—413 **10 Claims**



1. An automatically operated polarographic analyzing system for analyzing discrete samples comprising:

a vessel including in an upper portion means for deaerating each one of said samples comprising a nebulizer and a stream of inert gas;

collector means for collecting successive ones of said deaerated samples and an outlet for the exit of excess substances;

a polarographic cell including a dropping mercury electrode, said cell being external to said vessel and connected to said collector means by means of tubing passing through a wall of said vessel;

first pump means, coupled with said polarographic cell, defining means for moving a sample from said collector means to said polarographic cell for analysis, and second pump means, coupled with said polarographic cell, defining means for removing the sample after its analysis, said removing means being disposed below said dropping mercury electrode;

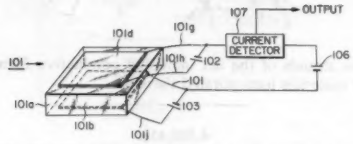
a platinum wire extending below the dropping mercury electrode of said polarographic cell and passing out of said polarographic cell; and

an outlet, close to the bottom end of the polarographic cell, connected to a reference electrode.

4,500,412
OXYGEN SENSOR WITH HEATER

Hideaki Takahashi; Kiyoharu Hayakawa; Haruyoshi Kondo, and Takashi Takeuchi, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Aug. 3, 1982, Ser. No. 404,900
Claims priority, application Japan, Aug. 7, 1981, 56-123122; Oct. 9, 1981, 56-160077; Dec. 2, 1981, 56-192744
Int. Cl.³ G01N 27/58
U.S. Cl. 204—425 16 Claims

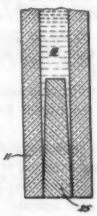


1. An oxygen sensor comprising an insulating substrate, a heater layer on a part of said substrate, said heater layer having a thickness of 0.2 μm to 20 μm and being made of a material selected from the group consisting of platinum, rhodium, palladium, and mixtures thereof, said insulating substrate having indentations which have a peak-to-peak thickness of up to 5 μm to provide bonding between said heater layer and said insulating substrate, and a further layer which has a thickness of about 0.01 μm to 1 μm and which is made of a material selected from the group consisting of aluminum, titanium, tungsten and molybdenum interposed between said insulating substrate and said heater layer so as to provide additional bonding therebetween.

4,500,413
SINTERED CERAMIC ARTICLE WITH POROUS REGION

Dale F. Taylor, Schenectady, and Louis S. Sammler, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,501
Int. Cl.³ G01N 27/30
U.S. Cl. 204—435 8 Claims



5. A reference electrode construction comprising a one-piece sintered metallic oxide housing enclosing a sealed electrolyte reservoir containing liquid electrolyte and an electrode spaced from said housing, the liquid electrolyte contained in said reservoir being in flow communication with the exterior of said housing solely through an imperfectly sintered porous metallic oxide region having a preselected effective open cross-sectional area, said porous region being in the general shape of a hollow cylinder extending through the otherwise non-porous sintered metallic oxide wall of said housing.

4,500,414
ENHANCED RECOVERY OF HYDROCARBONACEOUS FLUIDS FROM THE OIL SHALE

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 488,517, Apr. 25, 1983,. This application May 10, 1984, Ser. No. 609,074
Int. Cl.³ C10G 1/00
U.S. Cl. 208—11 R 10 Claims

1. A process for improving the recovery of hydrocarbon liquids and gases from oil shale comprising the steps of:

(a) subjecting the oil shale to retorting, under retorting conditions, to produce liquid and gaseous hydrocarbons and spent shale; and

(b) treating the spent shale with a solution of alkali-methoxide in methanol to recover additional hydrocarbon liquids and gases.

4,500,415
PROCESS OF CONVERTING NON-DISTILLABLE RESIDUES OF MIXED-BASE OR PARAFFIN-BASE CRUDE HYDROCARBON OILS

Thomas Simo, Bad Homburg; Karl-Heniz Eisenlohr, Buchschlag, and Hans-Hermann Puxbaumer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,294
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204546
Int. Cl.³ C10G 65/06, 65/08, 65/12
U.S. Cl. 208—56 12 Claims

1. A process for converting a non-distillable residue of a mixed-base or paraffin-base crude hydrocarbon oil to a distillable precursor for petrochemical products including motor fuels which comprises donor solvent hydrovisbreaking said residue in a hydrovisbreaking zone in the presence of a circulated hydrogen donor solvent at a temperature in the range 380° to 480° C. and at a pressure in the range of 40 to 200 bars and producing a liquid product, separating said liquid product by a first distillation into a naphtha fraction boiling below 200° C., a medium fraction boiling at 200° to 500° C. and a residue fraction boiling above 500° C., subjecting a branch stream of said medium fraction to a catalytic treatment in the presence of molecular hydrogen, said treatment comprising a selective catalytic hydrogenation followed by a selective catalytic cracking, said selective catalytic hydrogenation being conducted to such an extent as to selectively hydrogenate aromatic compounds to naphthenic compounds, the catalyst of said selective cracking being silicalite molecular sieve with a pore diameter in at least one dimension between 4 and 7 Angstroms, by said selective catalytic cracking paraffins are converted to naphtha fractions boiling below the boiling range of said hydrogen donor solvent, separating the product from said catalytic treatment by a second distillation into a naphtha fraction boiling below 200° C. and a higher boiling fraction with a boiling range of 200° to 500° C., said higher boiling fraction being solely used as said hydrogen donor solvent, the bromine number of said hydrogen donor solvent being the same as the bromine number of the fraction boiling at 200° to 500° C. of the product of said selective hydrogenation.

4,500,416
PROCESS FOR THE PREPARATION OF HYDROCARBON OIL DISTILLATES

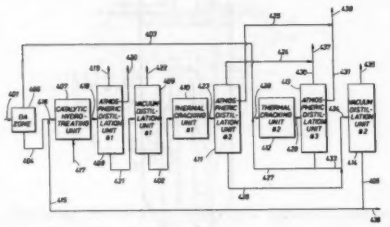
Robert H. van Dongen, and Willem H. J. Stork, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 420,556, Sep. 20, 1982, abandoned. This application Dec. 16, 1983, Ser. No. 562,993

Claims priority, application Netherlands, Dec. 16, 1981, 8105660

Int. Cl.³ C10G *67/04, 69/06*

U.S. Cl. 208—86 **9 Claims**



1. A process for the production of hydrocarbon oil distillates from a hydrocarbon mixture feed stream containing asphaltenes, said process comprising

(a) solvent deasphalting said feed stream in a deasphalting zone to obtain a deasphalted oil fraction and an asphaltic bitumen fraction;

(b) catalytically hydrotreating said asphaltic bitumen fraction in a hydrotreating zone, therein producing a first product stream having a reduced asphaltenes content;

(c) fractionating said first product stream into one or more light distillate fractions and a first heavy distillate fraction;

(d) thermally cracking said first heavy distillate fraction and said deasphalted oil fraction in a thermal cracking zone into a second product stream containing less than 20 percent by weight C_4 to C_1 hydrocarbons;

(e) fractionating said second product stream into one or more light distillate fractions and a second heavy distillate fraction; and

(f) routing said second heavy distillate fraction to said hydrotreating zone wherein said second heavy distillate fraction is catalytically hydrotreated.

4,500,417
CONVERSION OF FISCHER-TROPSCH PRODUCTS

Nai Y. Chen, Titusville; Werner O. Haag; Tracy J. Huang, both of Lawrenceville, all of N.J., and Stephen S. Wong, Langhorne, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1982, Ser. No. 453,970

Int. Cl.³ C10G *47/20*

U.S. Cl. 208—111 **16 Claims**

1. A process for upgrading the heavy oil fraction produced by syntheses of the Fischer-Tropsch type, said fraction having an initial boiling-point of at least about 125° C., said process comprising contacting the fraction and hydrogen gas under a combination of conversion conditions including a temperature of about 200° C. to 500° C., a hydrogen partial pressure of about 500 kPa to 20,000 kPa, and a liquid hourly space velocity of about 0.1 to 20, with a catalyst comprising zeolite beta composited with a hydrogenation metal said combination of conditions being effective to form a product that contains a hydrocarbon distillate fraction and a paraffin-type heavy hydrocarbon fraction suitable for conversion to lubricant oil.

12. A method of upgrading heavy oil fraction boiling above about 150° C. produced by a Fischer-Tropsch conversion of synthesis gas to liquid product, the method comprising contacting said heavy oil fraction and hydrogen under conversion conditions including a temperature of about 200° C. to 500° C. and a liquid hourly space velocity of about 0.1 to 20 with a metal-containing conversion catalyst comprising a large pore crystalline aluminosilicate having a silica to alumina ratio of at least 10:1 and selected from the group consisting of zeolite beta, dealuminized ZSM-20 and dealuminized Y, said conversion conditions being effective to convert a substantial portion of said heavy oil to a distillate boiling range product and a lubricant base stock.

4,500,418
CATALYSIS OVER ACTIVATED INORGANIC OXIDES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 355,414, Mar. 8, 1982, Pat. No. 4,427,791. This application Nov. 16, 1983, Ser. No. 552,547

Int. Cl.³ C10G *11/04, 11/08, 45/46*

U.S. Cl. 208—114 **8 Claims**

1. A process for converting a feedstock comprising hydrocarbon compounds to conversion products comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst comprising an inorganic oxide material selected from the group consisting of alumina and gallia treated by a method comprising contacting said material with a fluoride reagent selected from the group consisting of ammonium fluoride and boron fluoride at a temperature of from about 0° C. to about 100° C., contacting said fluoride reagent contacted material with an aqueous ammonium exchange solution and thereafter calcining said material at a temperature of from about 200° C. to about 600° C.

4,500,419
CATALYSIS OVER ACTIVATED ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 355,413, Mar. 8, 1982, Pat. No. 4,427,787. This application Nov. 16, 1983, Ser. No. 552,541

Int. Cl.³ C10G *11/05, 11/08, 45/54*

U.S. Cl. 208—115 **19 Claims**

1. A process for converting a feedstock comprising hydrocarbon compounds to conversion products comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a supported crystalline zeolite, said zeolite having an initial silica-to-alumina mole ratio greater than about 100, prepared by a method which comprises compositing said crystalline zeolite with alumina, reacting the composite with a dilute aqueous solution of hydrogen fluoride of from about 0.1 to about 5 Normal at a temperature of from about 0° C. to about 30° C. for a time of less than about 60 minutes, drying the hydrogen fluoride reacted composite, treating the dried hydrogen fluoride reacted composite by contact with an ammonium salt solution, by hydrolysis or ammonolysis, and calcining the resulting material at a temperature of from about 200° C. to about 600° C.

4,500,420
CATALYSIS OVER ACTIVATED ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 355,416, Mar. 8, 1982, Pat. No. 4,427,789. This application Nov. 16, 1983, Ser. No. 552,543

Int. Cl.³ C10G *11/05, 11/08, 45/54*

U.S. Cl. 208—116 **16 Claims**

1. A process for converting a feedstock comprising hydrocarbon compounds to conversion products comprising hydrocarbon compounds of lower molecular weight than feedstock

hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst comprising a zeolite composition prepared by a method which comprises the steps of (1) compositing a porous crystalline zeolite having an initial silica-to-alumina mole ratio greater than about 100 with alumina, (2) impregnating the composite under a vacuum with an aqueous solution of an alkali metal fluoride, (3) contacting the impregnated composite with a warm aqueous solution of an ammonium salt, and (4) calcining the ammonium salt solution contacted material at a temperature of from but 200° C. to about 600° C.

4,500,421

CATALYSIS OVER ACTIVATED ZEOLITES

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 355,417, Mar. 8, 1982, Pat. No. 4,427,790. This application Nov. 16, 1983, Ser. No. 552,544

Int. Cl.³ C10G *11/05, 11/08, 45/54*

U.S. Cl. 208—116 **18 Claims**

1. A process for converting a feedstock comprising hydrocarbon compounds to conversion products comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst comprising a zeolite composition prepared by a method comprising reacting a porous crystalline zeolite having an initial silica-to-alumina mole ratio greater than about 100 with a reagent having the formula:

$$L_{(n-m)}(MF_n)_e$$

wherein L is an organic or inorganic ionic moiety, (MF_n) is a fluoroanion moiety comprising the element M, M is an element selected from the group consisting of elements from Groups VB, VIB, VIIB, VIII, IIIA, IVA and VA of the Periodic Table of the Elements and Rare Earth elements, n is the coordination number of M, m is the valence of M and e is the charge associated with L, said reaction of said zeolite with said reagent being conducted at a temperature of from about −70° C. to about 80° C. and a pressure of from about −0.8 psig to about 50 psig.

4,500,422

CATALYSIS OVER ACTIVATED ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 355,415, Mar. 8, 1982, Pat. No. 4,427,788. This application Nov. 16, 1983, Ser. No. 552,542

Int. Cl.³ C10G *11/05, 11/08, 45/54*

U.S. Cl. 208—117 **14 Claims**

1. A process for converting a feedstock comprising hydrocarbon compounds to conversion products comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst comprising a zeolite composition prepared by a method which comprises impregnating a zeolite having an initial silica-to-alumina mole ratio of 70 or more with an ammoniacal aluminum fluoride solution at a temperature of from about 0° C. to about 100° C., said solution comprising from about 0.1 to about 5 weight percent of an aluminum fluoride in solution with at least one member selected from the group consisting of ammonium hydroxide and ammonia, contacting the impregnated zeolite with a warm aqueous 0.1 to 2 Normal solution of an ammonium salt, and calcining the ammonium salt solution contacted material at a temperature of from about 200° C. to about 600° C.

4,500,423

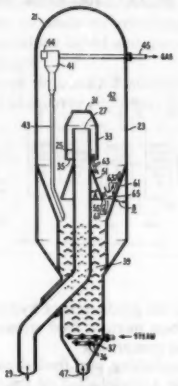
SEPARATION OF REACTED HYDROCARBONS AND CATALYST IN FLUIDIZED CATALYTIC CRACKING

Russell R. Krug, San Rafael, and Peter C. Schmidt, Walnut Creek, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 238,380, Feb. 26, 1981, abandoned. This application Jun. 13, 1983, Ser. No. 503,781

Int. Cl.³ C10G *11/18;* **F27P** *15/00*

U.S. Cl. 208—161 **12 Claims**



1. A process for separating hydrocarbon reaction products from catalyst in a fluidized catalytic reaction system comprising the steps of:

(a) conveying an input feed of a fluidized catalytic reaction mixture upwardly within a riser reaction conduit zone arranged generally within a disengaging vessel;

(b) deflecting the catalytic reaction mixture and constraining the resulting mixture of hydrocarbon vapor and catalyst to discharge generally vertically downwardly within an annular outlet zone around said conduit zone into said vessel;

(c) deflecting said downwardly moving mixture radially outwardly from said annular outlet zone toward the wall of said vessel to promote early disengagement of catalyst from hydrocarbon vapor;

(d) directing disengaged catalyst downwardly to a stripping zone arranged in a lower portion of said vessel; and

(e) recovering hydrocarbon vapors separated from catalyst in an upper portion of said vessel.

4,500,424

DESULFURIZATION CATALYST AND PROCESS

Howard D. Simpson, Irvine; Ryden L. Richardson, Whittier, and Kenneth Baron, Diamond Bar, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 7, 1983, Ser. No. 482,920

Int. Cl.³ C01G *45/08*

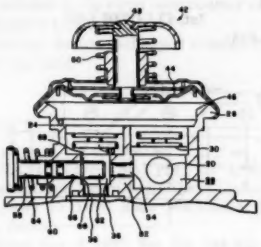
U.S. Cl. 208—216 PP **49 Claims**

1. A hydrocarbon conversion process comprising contacting a hydrocarbon oil with a particulate catalyst under conditions of elevated temperature above 600° F. and pressure above 500 p.s.i.g. and with hydrogen, said catalyst comprising at least one Group VIB metal component, at least one Group VIII metal component, and at least one phosphorous component on a porous refractory oxide support, said catalyst having at least about 75 percent of the total pore volume in pores of diameter from about 70 to about 130 angstroms and less than about 10 percent of the total pore volume in pores of diameter greater than about 130 angstroms.

4,500,425
PUMP VALVE FOR LIQUID SEPARATOR

Donald I. Thornton, Warwick, R.I., and Richard H. Peyton, Berkley, Mass., assignors to Allied Corporation, Morristown, N.J.

Filed Jun. 13, 1984, Ser. No. 620,215
Int. Cl.³ B01D 27/00
U.S. Cl. 210—136 5 Claims

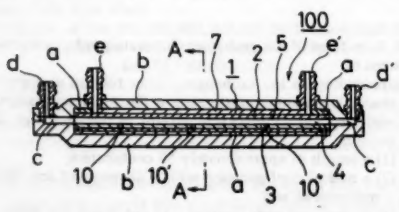


1. Separating device for a liquid flow system for removing material entrained in the liquid flowing through the system comprising a mounting head and a cartridge mounted on said mounting head, said cartridge containing at least one filtering medium for removing at least some of the material entrained in said liquid, said mounting head including an inlet and an outlet for connection with said liquid flow system, an inlet cavity communicated with said inlet, an intermediate cavity communicated with the upstream side of said filtering medium, said outlet being communicated with the downstream side of said filtering medium, a pumping chamber communicating with both said inlet and intermediate cavities, one-way check valve means permitting liquid communication from the inlet cavity into the pumping cavity and from the pumping cavity into the intermediate cavity but preventing communication in the opposite direction, manually-operated pumping means for forcing liquid from said inlet cavity into the pumping cavity and from said pumping cavity into said intermediate cavity, a bypass passage communicating the inlet with the intermediate cavity and bypassing said pumping cavity and said check valve means, and manually-operable means for closing said bypass passage when said pumping means is operated.

4,500,426
SEMIPERMEABLE MEMBRANE ELEMENTS

Kiyoshi Ishii; Masataka Murai, and Hitoshi Yonekawa, all of Saitama, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Continuation of Ser. No. 122,762, Feb. 15, 1980, abandoned.
This application Dec. 24, 1981, Ser. No. 334,082
Claims priority, application Japan, Feb. 15, 1979, 54-17572; Jun. 13, 1979, 54-74931
Int. Cl.³ B01D 31/00
U.S. Cl. 210—321.3 8 Claims

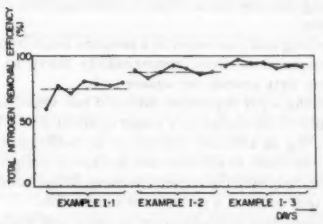


1. A semipermeable membrane element comprising at least one semipermeable membrane having an inlet end and an outlet end, said semipermeable membrane having an active side for being exposed to a feed liquid; a spacer being in contact with said semipermeable membrane and being disposed in a parallel confronting relation to said semipermeable membrane, said spacer being wave-shaped to form between said membrane and said spacer a multiplicity of parallel channels giving a maximum clearance of 35 to 500 microns, said spacer having at least two communicating portions for permitting said parallel channels to communicate with one another, the first communicating portion being disposed near and upstream of the outlet end of the semipermeable membrane and the second communicating portion being disposed near and downstream of the inlet end of said semipermeable membrane, said communicating portions comprising slits extending through the spacer and extending transversely to the spacer and perpendicular to the parallel channels, said slits extending across a major portion of the distance between the edges of the spacer that are parallel to said channels.

4,500,427
ACTIVATED-SLUDGE PROCESS FOR WASTEWATER TREATMENT

Akira Suzuki, Kasukabe; Yasumi Shioya; Norio Watanabe, both of Tokyo, all of Japan, and Keiichi Kimura, deceased, late of Tsuchiura, Japan (by Kazuyoshi Kimura, Toshi Kimura, heirs), assignors to Shinryo Air Conditioning Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1982, Ser. No. 439,578
Claims priority, application Japan, Nov. 9, 1981, 56-179332
Int. Cl.³ C02F 3/12
U.S. Cl. 210—608 6 Claims



1. An activated-sludge process for wastewater treatment comprising the steps of:

(1) feeding raw wastewater to an aeration tank containing mixed liquor;

(2) supplying air in an amount of not more than 3.0 m^3 air/MLSSO-kg/day into the aeration tank to produce aerobic and anaerobic areas in said tank;

(3) concentrating at least part of the return sludge or the mixed liquor to a solids content of at least 4 wt % in a flotation concentrator or a combination of said flotation concentrator and a roll press type dehydrator to thereby produce concentrated sludge and separated water; and

(4) feeding the concentrated sludge into the aeration tank at a SVI of not higher than 120 and maintaining the MLSS concentration in said tank at a value between 7,000 to 15,000 mg/liter, thereby removing the organic matter and nitrogen components from the wastewater within said aeration tank.

4,500,428

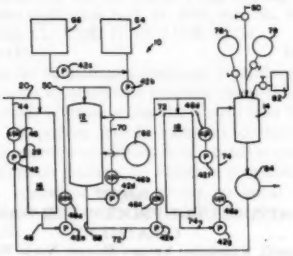
METHOD FOR THE TREATMENT OF WASTEWATER SLUDGE

Joseph M. Lynch, Secaucus; James R. Pfafflin, Gillette, both of N.J.; Calman Pecker, Long Island City; Raûl Cárdenas, Tappan, both of N.Y.; Seamus Cunningham, Secaucus, N.J.; Richard T. Bozzone, Sr., Parsippany, N.J., and Sidney Borg, Hoboken, N.J., assignors to Process Research Development & Management, Inc., Hoboken, N.J.

Division of Ser. No. 429,859, Sep. 30, 1982, Pat. No. 4,464,257. This application Aug. 6, 1984, Ser. No. 637,727

Int. Cl.³ C02F *11/02*

U.S. Cl. 210—609 4 Claims



1. A method of treating wastewater sludge, comprising the steps of:

providing a plurality of reaction vessels;

dewatering said wastewater sludge;

admitting the dewatered wastewater sludge into one of said vessels;

pressurizing said one vessel to a pressure taken from a range of pressures of from approximately thirty to approximately sixty pounds per square inch;

introducing a pH depressant into said one vessel to depress the pH of the sludge to a range of about 2 to 2.5; and

introducing an effective amount of an oxidizing agent into said one vessel to stabilize said dewatered sludge; wherein

said admitting step comprises retaining sludge admitted into said one vessel at a given level therewithin;

said pressurizing step comprises aerating said sludge in said one vessel at a location wherewithin which is below the retained, given level of the sludge with an aerating means comprising a vertical multiple-apertured cylinder capped at opposite ends supported within said one vessel below said level; and further including

maintaining a state of turbulence in the sludge retained in said one vessel; wherein

said turbulence-maintaining step comprises discharging stabilized sludge from said one vessel, removing a portion of said sludge from said one vessel and readmitting the same into said one vessel by dispersing said sludge into said one vessel above said level;

dewatering the sludge discharged from said one vessel;

admitting the dewatered sludge, discharged from said one vessel, into another of said reaction vessels;

admitting an effective amount of ozone and air into said another reaction vessel to stabilize said dewatered sludge; and

removing treated sludge from said another reaction vessel.

4,500,429

PROCESS FOR THE BIOLOGICAL PURIFICATION OF WASTE WATER

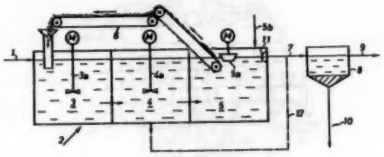
Hans Reimann; Allen Frydman, and Uwe Fuchs, all of Munich, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 19, 1984, Ser. No. 572,043

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301643

Int. Cl.³ C02F *3/08*

U.S. Cl. 210—616 17 Claims



1. In a process for the biological purification of phosphate-containing wastewater wherein the wastewater is treated, in the presence of activated sludge, at least a portion of which is attached on a carrier material, and the process comprising treating the wastewater in at least one aerobic, and an anaerobic zone, and discharging a substantially phosphate-free wastewater stream therefrom, the improvement comprising conducting the process with the activated sludge fixed on a movable carrier material, by conveying the carrier material from the anaerobic zone to the aerobic zone, and simultaneously recycling an amount of carrier material sufficient to conduct the process continuously from the aerobic zone to the anaerobic zone to cause the organisms in the sludge to take up phosphates whereby the activated sludge therein becomes enriched with the phosphates, and separating a portion of the thus phosphate-enriched sludge from the discharged treated wastewater to result in a substantially phosphate-free effluent.

4,500,430

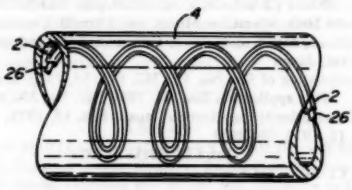
CONTINUOUSLY REJUVENATED ION EXCHANGER

Purnendu K. Dasgupta, 4345 28th St., Lubbock, Tex. 79410

Filed Sep. 22, 1982, Ser. No. 421,082

Int. Cl.³ B01J *47/12*

U.S. Cl. 210—638 51 Claims



50. A method of ion exchange chromatography comprising the steps of:

(a) providing an ion exchanging inner tube of a cation exchange membrane comprising a fluorocarbon backbone with pendant sulfonic acid groups as ion exchange sites having:

(1) a length of approximately 50 centimeters;

(2) a helical configuration with a diameter of less than 5 millimeters; and

(3) its terminal ends inserted into entry and exit tubes;

(4) a nylon filament contained therein; and

(b) enclosing the helix in a hollow outer tube having a larger diameter and longer length than the helix and having inlet and outlet apertures;

(c) sealing the ends of the outer tube around the entry and exit tubes leading to the helix;
(d) connecting the entry tube to the vessel containing the solution to undergo ion exchange;
(e) releasing the solution to the helical tube so that a flow rate between 0.5 and 5.0 milliliters per minute is established;
(f) simultaneously directing the flow of an appropriate regenerant solution in the outer tube counter current to the flow of solution in the helix; and
(g) and collecting the ion exchanged solution from the exit tube from the helix.

4,500,431

SEPARATION OF ANALYSIS OF ANIONS

Akiyoshi Miyanaga, and Yukitada Kurihara, both of Yokohama, Japan, assignors to Toyo Soda Manufacturing Co. Ltd., Yamaguchi, Japan

Filed Nov. 4, 1983, Ser. No. 548,828
Claims priority, application Japan, Nov. 9, 1982, 57-195236
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—656 **16 Claims**

1. A separation analysis of anions through liquid chromatography, which is characterized in that a solution prepared by mixing two components A and B is used as an eluent, where the component A is at least one compound selected from the group consisting of an aliphatic polycarboxylic acid, an aliphatic hydroxycarboxylic acid, an aromatic organic acid, a saccharic acid, a sugar and a sulphonate and the component B is at least one compound selected from the group consisting of borax, boric acid and an aliphatic monocarboxylic acid.

4,500,432

AUTOMATED SAMPLE CONCENTRATOR FOR TRACE COMPONENTS

John S. Poole, Wilmington, Del.; Dennis R. Gere, Westchester, Pa.; Raymond J. Bell, Landenberg, Pa., and Mark A. Nickerson, New London, Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.

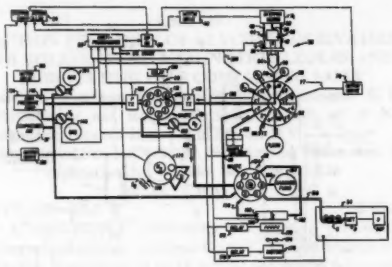
Continuation of Ser. No. 282,482, Jul. 13, 1981, abandoned. This application Oct. 4, 1983, Ser. No. 538,832
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—659 **24 Claims**

1. A method of concentrating solutes contained in a liquid solvent other than supercritical fluid before they are applied to chromatographic apparatus for analysis, the said method comprising:

passing the liquid solvent to waste through a first trapping means that adsorbs and accumulates at least some of the solutes from the solvent,

passing supercritical fluid through said first trapping means so as to adsorb at least some of the solutes therefrom and carry them into a second trapping means,

reducing the solubility parameter of the supercritical fluid in said second trapping means, and



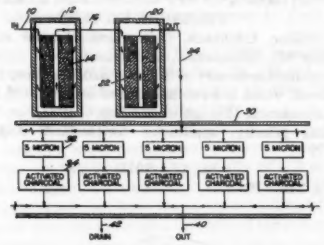
permitting the fluid of reduced solubility parameter to escape from said second trapping means, thereby leaving at least some of the solutes in said second trapping means.

4,500,433

METHOD OF REMOVING SALTS OF THE ALKALI EARTH METAL GROUP FROM WATER

Lee S. Ormbsy, 1185 Naragansett Blvd., Suite 305, Cranston, R.I. 02905

Filed Jan. 13, 1984, Ser. No. 570,549
Int. Cl.³ C02F *9/00*
U.S. Cl. 210—669 **2 Claims**



1. The method of removing salts of the alkali earth metal group from water comprising the steps of supplying water in a one-half inch pipe at 75 p.s.i, pre-filtering the water supply with a first five-micron filter to remove contaminants and reduce the flow rate to 4–5 g.p.m., connecting a second five-micron filter to the effluent of the first filter to reduce the flow rate to 3 g.p.m., passing the effluent through at least twelve parallel connected five-micron filter units the effluent of which is passed through at least twelve parallel connected activated charcoal filters, whereby the flow is reduced to approximately 0.5 g.p.m. to allow additional time for the water to contact the charcoal, whereby alkali earth metal salt is adsorbed.

4,500,434

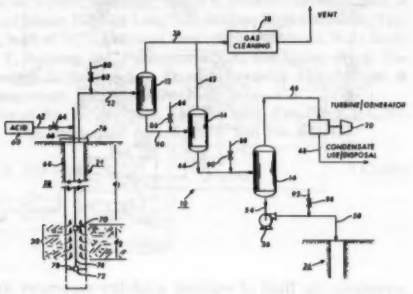
INHIBITING SCALE PRECIPITATION FROM HIGH TEMPERATURE BRINE

John W. Jost, Santa Ana, and Darrell L. Gallup, Ontario, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 2, 1982, Ser. No. 446,489
Int. Cl.³ C02F *5/08*
U.S. Cl. 210—696 **13 Claims**

1. A method for inhibiting the precipitation of iron silicate scale from a pressurized aqueous brine solution having a pH of about 5 to about 6, which solution contains dissolved scale-forming salts, during passage of the said fluid stream through

industrial equipment wherein the pressure is reduced so that at least a portion of the solution flashes to steam and dissolving



such scale previously formed comprising adding to the solution an amount of water-soluble acid sufficient to lower the pH of the solution by between about 0.1 and 0.3 pH unit.

4,500,435

METHOD AND APPARATUS FOR CLEANING PRESSURE FILTERS

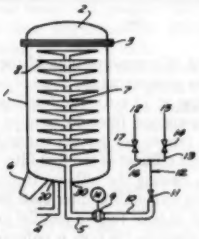
Hans Müller, Erlenbach, Switzerland, assignor to DrM, Dr. Müller AG, Maennedorf, Switzerland

Continuation-in-part of Ser. No. 320,711, Nov. 12, 1981, abandoned, which is a continuation of Ser. No. 175,193, Aug. 8, 1979, abandoned. This application Sep. 6, 1983, Ser. No. 529,537

Claims priority, application Switzerland, Aug. 8, 1979, 7261/79

Int. Cl.³ B01D *29/38*

U.S. Cl. 210—798 **5 Claims**



1. A method of cleaning a pressure filter having a plurality of filtering elements each provided with a filter fabric through which a material to be filtered is passed in a filtration direction and which is subjected to depositing of a filter cake during the filtering process, comprising the steps of intermittently supplying a backwash cleaning medium to said filtering elements, in the direction opposite to said filtration under repeated pulsating shock-like, rhythmic pressure impulses for pushing the cleaning medium through the filter fabric of the filter elements in said opposite direction without causing any vibrations of the latter to thereby efficiently remove the cake from each cleaning element and thus clean the filter fabric without requiring disassembling of the pressure filter, the cleaning medium being supplied with a frequency of approximately 10–160 impulses per minute.

4,500,436

SALTWATER AND HARD WATER BENTONITE MUD

Avtar S. Pabley, 7885 W. Walker Dr., Littleton, Colo. 80123

Continuation-in-part of Ser. No. 197,969, Oct. 17, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 419,946

Int. Cl.³ C09K *7/02*

U.S. Cl. 252—8.5 A **20 Claims**

1. A process for preparing a drilling mud comprising:

(a) measuring a quantity of water selected from the group consisting of saltwater and hard water sufficient to hydrate the mud;

(b) adding a caustic agent to the water of step (a) in an amount sufficient to product a pH in the prepared mud between about 8 and about 12;

(c) adding a filtration control agent to the mixture of step (b); and

(d) adding bentonite to the mixture of step (c) in a quantity sufficient to achieve the desired viscosity.

4,500,437

WATER SOLUBLE COPOLYMERS FOR USE IN FRACTURE-ACIDIZING OF WELLS

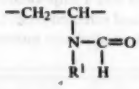
Friedrich Engelhardt, Frankfurt; Klaus Kuhlein, Kelkheim; Ulrich Riegel, Frankfurt; Sigmar von Halasz, Kelkheim, all of Fed. Rep. of Germany; Jeffery C. Dawson, Katy, and Anthony R. Reed, Houston, both of Tex., assignors to Cassella Aktiengesellschaft, Fed. Rep. of Germany and Dresser Industries, Inc., Houston, Tex.

Division of Ser. No. 216,671, Dec. 15, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 422,276

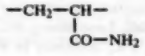
Int. Cl.³ E21B *43/27*

U.S. Cl. 252—8.55 C **9 Claims**

1. In the process for well stimulation by fracture acidizing with an aqueous acidic solution wherein said acidic solution is injected into said well to contact a formation under pressure sufficient to fracture the formation, the improvement wherein said acidic solution contains as a friction reducer a copolymer soluble in water and aqueous acids and having a K-value of from 25 to 250 and which comprises in a statistical distribution in the macromolecule, at least 5% by weight of structural units of the formula



wherein R^1 is hydrogen, methyl or hydroxymethyl; and at least 10% by weight of structural units of the formula



said acidic solution containing said copolymer in an amount of from 0.06 to 0.12% by weight.

4,500,438

MULTI-RING FLUORINATED CARBAMATES WITH TEXTILE SOIL REPELLENT ACTIVITY

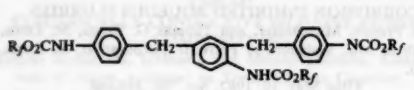
Michael G. Kelly, Coventry, R.I., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Jun. 24, 1983, Ser. No. 507,407

Int. Cl.³ D06M *13/40*; C07C *125/06*

U.S. Cl. 252—8.75 **10 Claims**

1. A compound of the formula



(I)

wherein R_f is a fluorinated radical of the formula $-W(C_nF_{2n})Y$ wherein W has from 1 to 10 carbon atoms and is selected from alkylene and W'—Z—(W")$_b$ where W' and W" are alkylene, Z is O, S, NHCO, or N(R)SO_2 wherein R is H or lower alkyl, and b is 0 or 1, Y is hydrogen, fluoro, or perfluoroalkoxy of 1 to 6 carbon atoms, and n is 2 to 20.

4,500,439

HYDROCARBON-SOLUBLE POLYAMINE-MOLYBDENUM COMPOSITIONS, LUBRICANTS AND GASOLINE CONTAINING SAME

C. Thomas West, and Robert J. Basalay, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 301,752, Sep. 14, 1981, abandoned, which is a division of Ser. No. 190,590, Sep. 25, 1980, Pat. No. 4,357,149. This application Oct. 14, 1983, Ser. No. 542,011

Int. Cl.³ C10M *1/54*

U.S. Cl. 252—46.4 **3 Claims**

1. An improved hydrocarbon-soluble molybdenum composition which comprises reaction product of a molybdenum compound and a sulfurized hydrocarbon-soluble polyamine compound wherein a hydrocarbon-soluble polyamine compound is reacted with sulfur or a sulfur-yielding compound to produce a sulfurized hydrocarbon-soluble polyamine compound prior to reaction with the molybdenum compound, said reaction product of a molybdenum compound and a sulfurized hydrocarbon-soluble polyamine compound being obtained at a temperature within the range of about 50° C. to 300° C. and a mole ratio within the range of about 0.5 to 10 moles of molybdenum compound per mole of amine in the sulfurized hydrocarbon-soluble polyamine compound, said molybdenum compound being a compound which produces ammonium molybdate, molybdic acid, and/or molybdic oxide under reaction conditions, and said hydrocarbon-soluble polyamine compound being selected from substituted dicarboxylic acid compound-polyamine reaction products, or sulfurized and/or oxidized derivatives thereof, wherein said substituted dicarboxylic acid compound of said substituted dicarboxylic acid compound-polyamine reaction products comprises a hydrocarbyl-substituted succinic acid compound.

2. A lubricant comprising a lubricating base oil and an effective friction modifying amount of the hydrocarbon-soluble molybdenum composition of claim 1.

3. A gasoline containing sufficient hydrocarbon-soluble polyamine molybdenum composition to supply about 0.1–10,000 parts of molybdenum per one million parts of gasoline, wherein said hydrocarbon-soluble polyamine molybdenum composition is a reaction product of a molybdenum compound and a sulfurized hydrocarbon-soluble polyamine compound wherein a hydrocarbon-soluble polyamine compound is reacted with sulfur or a sulfur-yielding compound to produce a sulfurized hydrocarbon-soluble polyamine compound prior to reaction with the molybdenum compound, said reaction product of a molybdenum compound and a sulfurized hydrocarbon-soluble polyamine compound being obtained at a temperature within the range of about 50° C. to 300° C. and a mole ratio within the range of about 0.5 to 10 moles of molybdenum compound per mole of amine in the sulfurized hydrocarbon-soluble polyamine compound, said molybdenum compound being a compound which produces ammonium molybdate, molybdic acid, and/or molybdic oxide under reaction conditions, and said hydrocarbon-soluble polyamine compound being selected from substituted dicarboxylic acid compound-polyamine reaction products, or sulfurized and/or oxidized derivatives thereof, wherein said substituted dicarboxylic acid compound of said substituted dicarboxylic acid compound-polyamine reaction products comprises a hydrocarbyl-substituted succinic acid compound.

4,500,440

REACTION PRODUCTS OF GLYCIDYL DERIVATIZED POLYOLEFINS AND 5-AMINOTETRAZOLES AND LUBRICATING OILS CONTAINING SAME

Benjamin J. Kaufman, Wappingers Falls; Christopher S. Liu, Poughkeepsie, and Rodney L. Sung, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 439,159, Nov. 4, 1982, abandoned. This application Jul. 6, 1984, Ser. No. 628,536

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—51.5 A **8 Claims**

1. A multi-purpose lubricating oil additive prepared by grafting an oil-soluble ethylene-C_3 to C_{12} olefin hydrocarbon copolymer containing 25 to 55 weight percent of polymerized ethylene units having an average chain length of 2700 to 8800 carbon atoms with glycidyl methacrylate in the presence of a free radical initiator to produce an intermediate reaction product and reacting said intermediate reaction product with a 5-aminotetrazole under condensation reaction conditions to produce said lubricating oil additive.

5. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and from about 0.5 to 25.0 weight percent of the reaction product of claim 1.

4,500,441

CONTACT LENS CLEANING AND STORAGE COMPOSITION

Kyoichi Tanaka; Akira Tsuzuki, both of Nagoya, and Shunichi Hioki, Ichinomiya, all of Japan, assignors to Toyo Contact Lens Co., Ltd., Japan

Continuation of Ser. No. 375,095, May 5, 1982, abandoned. This application Mar. 9, 1984, Ser. No. 586,883

Claims priority, application Japan, May 13, 1981, 56-70766

Int. Cl.³ C11D *3/48*

U.S. Cl. 252—89.1 **4 Claims**

1. An aqueous water-nonabsorptive contact lens cleaning and storage solution consisting essentially of (1) an anionic surface active agent, (2) a non-ionic surface active agent, and (3) a compound selected from the group consisting of polysaccharides and derivatives thereof, the ratio of the component (1) to the component (2) being from about 32:68 to about 94:6 by weight, the total concentration of the components (1) and (2) being from about 0.05 to about 4.5% by weight, the concentration of the component (3) being from 0.01 to 10% by weight, and said solution having a pH of 4.8 to 8.5,

wherein the anionic surface active agent is selected from the group consisting of a sodium alkylbenzene sulfonate, a sodium alpha-olefin sulfonate, a sodium polyoxyethylene alkylether sulfates, a sodium alkyloylmethyltaurinate, a sodium alkyloylsarcosinate, a sodium polyoxyethylene alkylether phosphate, a sodium di(polyexythylene alkylether)phosphate, and a sodium polyoxyethylene alkylphenylether sulfate; and

wherein the non-ionic surface active agent is selected from the group consisting of a polyoxyethylene higher fatty acid ester, a higher fatty acid ester with a polyoxyalkylene-polyoxyethylene copolymer; a higher fatty acid ester with a polyhydric alcohol; a higher fatty acid ester with a polyoxyethylene polyhydric alcohol including polyoxyethylene glyceryl fatty acid esters and polyoxyethylene sorbitan fatty acid esters; a polyglycerin fatty acid ester; a polyoxyethylene alkyl ether; a polyglycerin ether with an alcohol; a polyoxyethylene fatty acid amide; a polyoxyethylene alkylamine; a polyoxyethylene alkylphenyl ether; a condensate of polyoxyethylene alkylphenol ether with formaldehyde; a polyoxyethylenepolyoxypropylene block copolymer; a phosphate, a polyethyleneglycol adduct of one of a hydrogenated castor oil, castor oil and sterol; and a polyoxyethylene sorbian fatty acid ester.

4,500,442

COMPOSITIONS CONTAINING MOLD RELEASE AGENTS

Louis W. Meyer, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 462,154, Jan. 28, 1983, Pat. No. 4,451,425.
This application Feb. 10, 1984, Ser. No. 578,926
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—182 **10 Claims**

1. A composition comprising

(A) at least one active hydrogen-containing material having an average of more than one active hydrogen atom per molecule; and

(B) at least one hydroxylated lecithin; and

wherein component (B) is present in a quantity of at least about 0.1 parts per 100 parts by weight of component (A) up to the miscibility limit of the mixture.

4,500,443

BLUE-GREEN EMITTING HALOPHOSPHATE PHOSPHOR

Akira Taya, Kawasaki; Kazuo Narita, Tokyo; Masao Asada, and Yoshio Kimura, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 413,243, Aug. 30, 1982, abandoned.
This application Jun. 8, 1984, Ser. No. 617,940
Claims priority, application Japan, Sep. 3, 1981, 56-137837
Int. Cl.³ C09K *11/465*
U.S. Cl. 252—301.4 P **4 Claims**

1. A blue-green emitting halophosphate phosphor activated with divalent europium, which is represented by the formula

$$M_{5-x}X(PO_4)_3:Eu^{2+}{}_{(x)}$$

wherein M consists of about 3 to about 4.5 gram-atom of barium, about 0.5 to about 2 gram-atom of calcium and about 0.01 to about 1 gram-atom of magnesium; X is one or more of fluorine, chlorine and bromine; and x is more than 0.01 and not more than 0.2, said phosphor exhibiting a higher luminescent intensity when irradiated by 254 nm radiation and higher maintenance factors A and B than said phosphor absent magnesium.

4,500,444

PROCESS FOR PREPARING BASIC ALUMINUM CARBONATE GELS SUBSTANTIALLY FREE FROM FOREIGN ANIONS AND FIBROUS COLLOIDAL ALUMINA MONOHYDRATE OF A BOEHMITE CRYSTAL LATTICE STRUCTURE

Stewart M. Beekman, 401 High St., Milton, Pa. 17847

Filed Apr. 22, 1982, Ser. No. 370,898
Int. Cl.³ B01J *13/00;* **C01F** *7/14;* **A61K** *33/08*
U.S. Cl. 252—315.7 **11 Claims**

1. A process for preparing basic aluminum carbonate gels that can be washed to an $SO_4^=/Al_2O_3$ ratio of less than 0.01 and a sodium Na^+/Al_2O_3 ratio of less than 0.01 which comprises reacting in aqueous solution having a pH of about 6.8 ± 0.2 at a temperature within the range from about 10° to about 50° C. sodium aluminate and carbon dioxide, thereby forming a precipitate of basic aluminum carbonate gel, and separating the gel from the reaction medium by filtration.

4,500,445

CORROSION INHIBITED AQUEOUS SLURRIES

Eddie French, Manchester, and Thomas G. Braga, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 10, 1982, Ser. No. 356,668
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—387 **21 Claims**

1. A non-chromate composition of matter comprising an aqueous oxygen-containing slurry of erosive particulate matter selected from the group consisting of ore and coal containing a corrosion inhibiting amount of a phosphocomposition selected from the group consisting of polyphosphate salts and mixtures thereof.

4. The composition of claim 1 where the phospho-composition is tetrapotassium pyrophosphate.

5. The composition of claim 4 which contains also 2-phosphono-1,2,4-butane tricarboxylic acid.

4,500,446

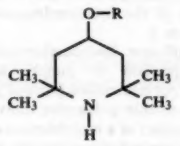
MIXED UNSATURATED MONOCARBOXYLIC ACID ESTERS OF 2,2,6,6-TETRAMETHYL-4-PIPERIDINOL AND OF ITS AMMONIUM CARBOXYLATE AS STABILIZER AGAINST UV IN POLYMERIC MATERIALS

Julius Durmis; Alojz Balogh; Milan Karvas; Maria Hrachovcová; Jan Masek; Pavol Caucik, and Marta Povazancová, all of Bratislava, Czechoslovakia, assignors to Chemicke zavody Juraja Dimitrova, narodny podnik, Bratislava, Czechoslovakia

Filed Sep. 23, 1982, Ser. No. 421,790
Claims priority, application Czechoslovakia, Sep. 23, 1981, 7009-81
Int. Cl.³ C09K *15/22*
U.S. Cl. 252—403 **3 Claims**

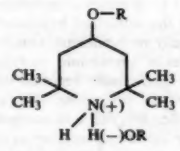
1. Stabilization mixture for polyolefins, styrene polymers and copolymers and polyurethanes comprising

(a) from 80–100%, by weight, of a mixture of 2,2,6,6-tetramethyl-4-piperidinol esters of the formula



wherein R is an acyl residue derived from a straight or branched chain unsaturated monocarboxylic acid of 14–18 carbon atoms and

(b) from 0–20%, by weight, of ammonium carboxylates of the formula



wherein R is as defined above.

4,500,447

ELECTRICALLY CONDUCTIVE SILICONE RUBBER COMPOSITIONS

Hideki Kobayashi, Ichihara, and Mitsuo Hamada, Kisarazu, both of Japan, assignors to Toray Silicone Company, Inc., Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,522
Claims priority, application Japan, Sep. 8, 1982, 57-156123
Int. Cl.³ H01B 1/06
U.S. Cl. 252—511 14 Claims

1. A curable, electrically conductive silicone rubber composition comprising

(A) 100 parts by weight of a polyorganosiloxane having a viscosity of at least 0.1 mm^2/s and an average unit formula $R_aSiO_{4-a/2}$, where R represents a monovalent hydrocarbon radical or a 2-cyanoethyl radical, a has a value of from 1.95 to 2.05, and at least 90 mol % of the R radicals are methyl;

(B) 0 to 100 parts by weight of a finely divided silica filler;

(C) 5 to 100 parts by weight of an electrically conductive carbon black;

(D) 1 to 100 parts by weight of an incompatible polyorganosiloxane having a viscosity of from 0.01 to 10 mm^2/s at 25° C. and an average unit formula

$$R_b^1R_c^2SiO_{(4-b-c)/2},$$

where R^1 is selected from the same group as R, R^2 represents a halogenated hydrocarbon radical, b is from 1 to 3 inclusive, c is from 0.001 to 1 inclusive, the sum of b and c is from 1.95 to 2.95 inclusive and where said incompatible polyorganosiloxane bleeds out at a controlled rate from the surface of said silicone rubber composition following curing of said composition;

(E) 0.1 to 10 parts by weight of a curing agent for (A), said curing agent being selected from the group consisting of organoperoxides and combinations of a polyorganohydrogensiloxane, a polyorganosiloxane (A) containing alkenyl radicals and an amount of a platinum-containing catalyst sufficient to cure said composition.

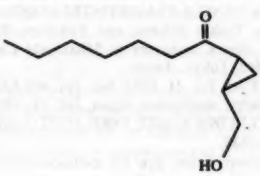
4,500,448

1-HYDROXYMETHYL CYCLOPROPANES ORGANOLEPTIC USE OF SAME

Richard M. Boden, Ocean; Marie R. Hanna, Hazlet, and Theodore J. Tyszkiewicz, Sayreville, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 422,486, Sep. 23, 1982, Pat. No. 4,435,426.
This application Oct. 12, 1983, Ser. No. 541,275
Int. Cl.³ A61K 7/46
U.S. Cl. 252—522 R 1 Claim

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material, an aroma augmenting or enhancing quantity of the compound having the structure:



4,500,449

METHOD FOR SOLIDIFYING BORON-CONTAINING RADIOACTIVE RESIDUES

Klaus Kuhnke; Dietmar Bege, both of Erlangen; Anwer Puthawala, Erlangen-Buckenhof, and Günter Wittrowsky, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Continuation of Ser. No. 123,445, Feb. 21, 1980, abandoned.
This application Apr. 23, 1982, Ser. No. 371,125
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1979, 2910677
Int. Cl.³ G21F 9/16
U.S. Cl. 252—628 2 Claims

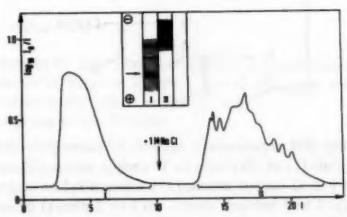
1. Method for the treatment of radioactive concentrates from liquid wastes containing boron of pressurized water reactors, for storage and mixing with a binding agent, which comprises adding sodium hydroxide to said radioactive waste concentrate containing boron to obtain a mole ratio of sodium to boron of about 0.7 with a corresponding pH value in the range of 9.8 to 10.2 to produce a reaction product having approximately the following composition: $2Na_2O \times 3B_2O_3 \times 4H_2O$, said reaction product characterized by being in the molten phase at a temperature within the range of 50° C. to below the temperature at which the concentrate would evaporate, and maintaining the mixture of radioactive waste concentrate containing boron and sodium hydroxide at a temperature of at least 50° C. but below the temperature at which the concentrate would evaporate during said reaction of sodium hydroxide with the radioactive waste and during holding-time prior to mixing with a binding agent to prevent crystallization of boron compounds in the mixture, without further chemical treatment to chemically alter the boron compounds and without prior drying the mixture to cause crystallization of the boron compounds to retain them in the liquid state, and subsequently introducing the mixture into a worm mixing device maintained at an elevated temperature in which the reaction product retains its liquid state upon contacting and mixing with a binding agent also introduced into the worm mixer.

4,500,450

POLYPEPTIDE HAVING AN ACTION ON THE IMMUNOLOGICAL SYSTEM, PROCESS FOR ITS ISOLATION AND PURIFICATION, ITS USE, AGENTS CONTAINING THIS COMPOUND, AND ITS CLEAVAGE PRODUCTS, THEIR USE AND AGENTS CONTAINING THESE PRODUCTS

Gerhard Seipke, Wiesbaden; Dominique Tripier, Eppstein, and Gerd Johnscher, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,204
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1982, 3230151
Int. Cl.³ G01N 33/50
U.S. Cl. 260—112 R 2 Claims



1. A polypeptide having an action on the immunological system, which has a molecular weight of 3,480, a UV absorption with a maximum at 205 to 210 nm, an isoelectric point at 3.95±0.15 and the following amino acid composition: 4 aspara-

ginic acid units, 3 threonine units, 3 serine units, 6 glutamic acid units, 1 glycine unit, 4 alanine units, 3 valine units, 1 isoleucine unit, 1 leucine unit, 5 lysine units and 1 arginine unit, the N-terminal, if appropriate, carrying an acyl group having 1 to 6 carbon atoms or an acylglycyl group, the acyl group of which has 1 to 6 carbon atoms, and/or pharmacologically acceptable salts.

4,500,451

NEW PROTEIN PP_{13} EXTRACTED FROM HUMAN PLACENTAL TISSUES AND USE THEREOF

Hans Bohn, Marburg, and Walter Kraus, Cölbe, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Aug. 18, 1983, Ser. No. 524,201

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3230996

Int. Cl.[3] **A23J** *1/06;* **C07K** *7/00;* **C07G** *7/26;* **A61K** *39/00*

U.S. Cl. 260—112 R **3 Claims**

1. A new placental protein PP_{13} extracted from human placental tissue characterized by the following:

(a) an electrophoretic mobility in the same range as albumin,

(b) an isoelectric point of 4.75±0.15,

(c) a sedimentation coefficient $S_{20^0,w}$ of 3.1±0.15,

(d) a molecular weight determined by ultracentrifugation of 30,000±5,000,

(e) a molecular weight determined in a polyacrylamide gel containing sodium dodecyl sulfate (SDS) of 29,000±3,000,

(f) an extinction coefficient $E_{1cm}^{1\%}$ (280 nm) of 9.8±0.3 and

(g) a carbohydrate content of 1% (0.1±0.05% mannose, 0.2±0.1% galactose, 0.1±0.05% xylose, 0.2±0.1% glucosamine, and neuraminic acid not detected).

4,500,452

(AMIDO)N-SUBSTITUTED BLEOMYCINS, SALTS THEREOF AND PROCESS FOR PREPARATION THEREOF

Hamao Umezawa, Tokyo; Akio Fujii, Kamakura; Yasuhiko Muraoka, Kitamoto; Tokuji Nakatani, Saitama; Takeyo Fukuoka, Yono, and Katsutoshi Takahashi, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

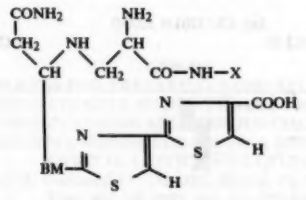
Division of Ser. No. 451,437, Dec. 20, 1982, Pat. No. 4,472,304. This application Jun. 18, 1984, Ser. No. 621,795

Claims priority, application Japan, Dec. 29, 1981, 56-210447

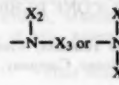
Int. Cl.[3] **C07C** *103/52*

U.S. Cl. 260—112.5 R **1 Claim**

1. An (amido)N-substituted bleomycinic acid represented by the following formula or a salt thereof:



wherein BM represents a moiety of bleomycin skeleton; X represents (1) an alkyl of 1 to 18 carbon atoms, (2) an aminoalkyl of 1 to 12 carbon atoms, (3) a lower alkyl having as substituent (a) 1 to 3 halogen atoms, (b) 1 or 2 phenyl groups, (c) an indolyl group, or (d) a 5- or 6-membered heterocyclic group containing an oxygen, sulfur or nitrogen atom (among the substituent groups, the phenyl or indolyl group may be further substituted by a halogen atom or a lower alkoxy group), (4) X_1-(lower)alkyl, [where X_1 is



X_2 is a hydrogen atom, a lower alkyl or benzyl, X_3 is (a) a lower alkyl, (b) a phenyl(lower)alkyl, or (c) a mono- or di-(lower)alkylamino(lower)alkyl which may be substituted by a phenyl or halophenyl group, X_4 is (a) a lower alkyl or (b) a phenyl(lower)alkyl], (5) naphthyl, (6) thiazolyl, or (7) an N-phenyl(lower)alkylpiperazinyl.

4,500,453

CROSS-LINKED PROTEIN COMPOSITION USING ALUMINUM SALTS OF ACETIC ACID

Joseph L. Shank, Matteson, Ill., assignor to DynaGel Incorporated, Calumet City, Ill.

Filed Jun. 29, 1984, Ser. No. 626,533

Int. Cl.[3] **C09H** *7/00;* **G03C** *1/30*

U.S. Cl. 260—117 **19 Claims**

1. A cross-linked collagen-derived protein composition having improved Bloom gel strength and increased viscosity, said protein composition being the reaction product of a water-soluble collagen-derived protein with an aluminum salt of acetic acid selected from the group consisting of aluminum subacetate, aluminum triacetate and an alkali metal aluminum acetate double salt.

4,500,454

VEGETABLE PROTEIN EVIDENCING IMPROVED SOLUTION VISCOSITY

Pei K. Chang, Montrose, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 3, 1982, Ser. No. 446,825

Int. Cl.[3] **B23J** *1/14*

U.S. Cl. 260—123.5 **16 Claims**

1. A process for treating vegetable protein which comprises subjecting a substantially dry protein composition wherein the moisture content of the composition is less than 8% and which composition contains at least 60% protein which is substantially insoluble at its isoelectric point and substantially soluble above and below its isoelectric point to a heat treatment at a level of up to about 10% relative humidity for a period of time sufficient to modify the protein, said period of time being at least 0.5 days, such that the viscosity of a 10% solution of said treated protein composition is increased over a solution of untreated protein composition by at least 100%.

4,500,455

REACTIVE DISPERSE DIAMINOPYRIDINE AZO DYES CONTAINING A FLUOROSTRIAZINE GROUP

Toshio Niwa; Toshio Hihara, and Yukiharu Shimizu, all of Kanagawa, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Jul. 21, 1982, Ser. No. 400,533

Claims priority, application Japan, Jul. 21, 1981, 56-114231

Int. Cl.[3] **C09B** *62/085;* **D06P** *1/382, 3/66, 3/84*

U.S. Cl. 534—635 **3 Claims**

1. A diaminopyridine dye for cellulose-containing fibers, represented by the formula (I):

4,500,456

PREPARATION OF 4-FLUOROAZETIDINONES USING $FClO_3$

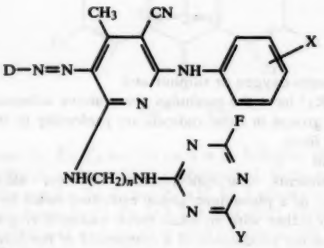
Wayne A. Spitzer, and Theodore Goodson, Jr., both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 241,989, Mar. 9, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,384

Int. Cl.[3] C07D 205/08, 401/04, 403/04; C07B 9/00

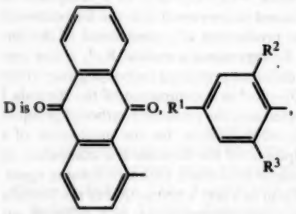
U.S. Cl. 260—239 A 5 Claims

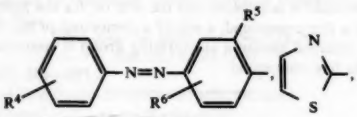
1. A process for preparing a 4-fluoroazetidinone of the formula

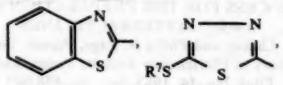


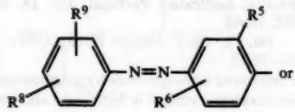
(I)

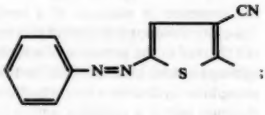
wherein











;

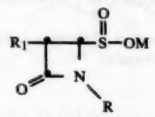
X is hydrogen or halogen;

Y is alkoxy containing from 1 to 5 carbons, —O—R^{1}-o—O—R^{11}, or phenoxy; and

n is 2 or 3

wherein R^1 is nitro, cyano, methylsulfonyl, phenylsulfonyl, mono- or di-lower alkylaminosulfonyl, acetyl, or benzoyl; R^2 and R^3 are each hydrogen, trifluoromethyl, halogen, or cyano; R^4 is hydrogen, lower alkyl, mono- or di-lower alkylaminosulfonyl, mono- or di-lower alkylcarbamoyl, or acetylamino; R^5 and R^6 are each hydrogen, halogen, or lower alkyl; R^7 is lower alkyl; R^8 is trifluoromethyl, or halogen; R^9 is hydrogen, or halogen; R^{10} is ethylene, or propylene; and R^{11} is methyl, or an ethyl.

which comprises mixing in an aprotic inert organic solvent at a temperature between about −80° C. and about −25° C. an azetidinone of the formula

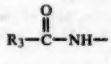


with perchloryl fluoride, where in the above formulae R_1 is

(1) an imido group of the formula

wherein R_2 is C_2–C_4 alkylene or 1,2-phenylene;

(2) an amido group of the formula

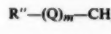


wherein R_3 is

(a) hydrogen, C_1–C_4 alkyl, halomethyl, cyanomethyl, benzyloxy, p-nitrobenzyloxy, t-butyloxy, 2,2,2-trichloroethoxy, or p-methoxybenzyloxy;

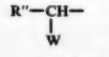
(b) the group R′, wherein R′ is phenyl or phenyl substituted by 1 or 2 halogens, hydroxy, protected hydroxy, nitro, cyano, C_1–C_4 alkyl, or C_1–C_4 alkoxy;

(c) a group of the formula



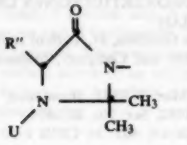
wherein R″ is R′ as defined above, 1,4-cyclohexadienyl, thienyl or furyl; m is 0 or 1; and Q is O or S; with the limitation that when m is 1, R″ is R′;

(d) a group of the formula



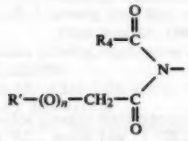
wherein R″ is as defined above, and W is hydroxy, protected hydroxy, carboxy, protected carboxy, amino, or protected amino;

(3) an imidazolidinyl group of the formula



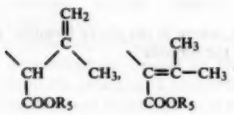
wherein R'' is as defined above and U is nitroso or acetyl; or R_1 is

(4) an imido group of the formula



wherein R' is as defined above, n is 0 or 1, and R_4 is C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, or 2,2,2-trichloroethoxy;

R is a carboxy-substituted or esterified carboxy-substituted butenyl group represented by the formulas



wherein R_5 is hydrogen or a protected carboxy group; and M is hydrogen, sodium or potassium.

4,500,457

PROCESS FOR PREPARING THIA-AZA COMPOUNDS WITH A BETA-LACTAM RING

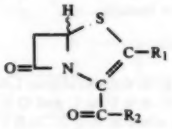
Jacques Gosteli, Basel; Ivan Ernest, Birsfelden, both of Switzerland, and Robert B. Woodward, Cambridge, Mass., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 902,639, May 4, 1978, Pat. No. 4,331,676. This application Mar. 1, 1982, Ser. No. 353,288

Int. Cl.³ C07D *501/02*

U.S. Cl. 260—245.2 R **5 Claims**

1. Process for the manufacture of 2-penem-3-carboxylic acid compounds of the formula



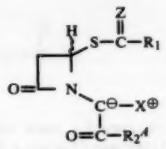
(I)

in which a carbon atom to the ring carbon atom, or an etherified mercapto group

and

R_2 represents hydroxy or a radical R_2^A forming together with the carbonyl grouping —C(=O)— a protected carboxyl group,

1-oxides thereof, as well as pharmaceutically acceptable salts of such compounds having salt-forming groups, characterised in that an ylid compound of the formula



(II)

in which

Z represents oxygen or sulphur and

R_1 and R_2^A have the meanings given above wherein functional groups in these radicals are preferably in the protected form

and wherein

$X^{\oplus}$ represents triarylphosphonio, tri-lower alkylphosphonio, or a phosphono group esterified twice by lower alkyl together with an alkali metal cation, is ring closed, and, for the production of a compound of the formula I, wherein R_2 represents hydroxy, the protected carboxyl group of the formula —C(=O)—R_2^A in a compound of the formula I obtained is converted into the free carboxyl group, or, for the production of a compound of the formula I, wherein R_2 represents a radical R_2^A, a free carboxyl group or a different protected carboxyl group of the formula —C(=O)—R_2^A in a compound of the formula I obtained is converted into the protected carboxyl group of the formula —C(=O)—R_2^A, or, for the production of a 1-oxide of a compound of the formula I, a compound of the formula I obtained is oxidised with an oxidising agent, or, for the production of a salt, a compound of the formula I obtained having a salt-forming group or a different salt obtained is converted into the salt, or, for the production of a free compound, a salt of a compound of the formula I obtained having a salt-forming group is converted into the free compound.

4,500,458

PROCESS FOR THE PREPARATION OF α-6-DEOXYTETRACYCLINES

Ivan Villax, Lisbon, and Philip R. Page, Parede, both of Portugal, assignors to Plurichemie Anstalt, Vaduz, Liechtenstein

Filed Jan. 14, 1983, Ser. No. 458,067

Claims priority, application Portugal, Jan. 19, 1982, 74303; Dec. 30, 1982, 76061

Int. Cl.³ C07C *103/19*; B01J *31/04*

U.S. Cl. 260—351.5 **20 Claims**

1. A new improved homogeneous hydrogenation process to prepare α-6-deoxytetracyclines in high yield and purity from a 6-deoxy-6-demethyl-6-methylenetetracycline or salt thereof in the presence or absence of a tertiary phosphine or from a 11a-chloro-6-deoxy-6-demethyl-6-methylenetetracycline or a salt thereof in the presence of a tertiary phosphine by catalytic hydrogenation, characterised in that the catalyst is a tertiary phosphine-hydrazino-chlororhodium obtained by reacting a rhodium salt or a complex with a hydrazine or salt thereof.

4,500,459

TETRACYANOANTHRAQUINODIMETHANE COMPOUNDS

Shu Hotta, Hirakata; Tomiharu Hosaka, Yawata, and Wataru Shimotsuma, Ibaragi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

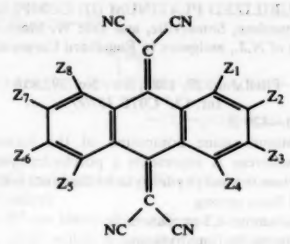
Filed Mar. 12, 1982, Ser. No. 357,664

Claims priority, application Japan, Mar. 13, 1981, 56-36728

Int. Cl.³ C07C *50/20*

U.S. Cl. 260—396 N **1 Claim**

1. A 11,11,12,12-tetracyano-9,10-anthraquinodimethane compound of the general formula



wherein Z_2, Z_3, Z_6 and Z_7 each is H, halogen, alkyl, phenyl, alkylphenyl, hydroxyalkyl, carboxyalkyl, hydroxy, amino or carboxy and Z_1, Z_4, Z_5 and Z_8 is H, Cl, hydroxy or amino; said halogen being F, Cl, Br or I and said alkyl, alkylphenyl, hydroxyalkyl and carboxyalkyl each containing up to 8 carbon atoms with the proviso that at least one of Z_1 to Z_8 must be halogen, hydroxy or amino.

4,500,460

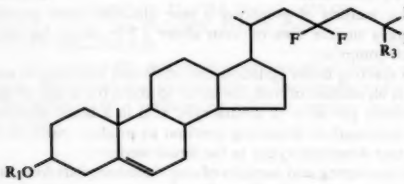
23,23-DIFLUORO-25-HYDROXY-VITAMIN D_3 AND PROCESS FOR PREPARING SAME

Hector F. DeLuca; Yoko Tanaka, both of Madison, Wis.; Nobuo Ikekawa, and Yoshiro Kobayashi, both of Tokyo, Japan, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 18, 1983, Ser. No. 524,269
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.2 **7 Claims**

1. 23,23-difluoro-25-hydroxycholecalciferol.

3. Compounds having the formula



wherein

R_1 is selected from acyl and tetrahydro-pyranyl

X is halogen or hydroxy and

R_2 and R_3 are selected from $COOR_4$, CH_2OH and hydrogen where R_4 is lower alkyl.

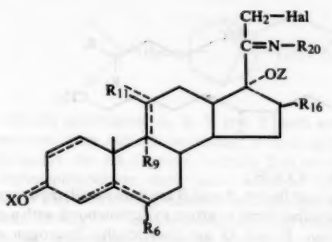
4,500,461

CYANOHYDRIN PROCESS

Verlan H. VanRheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

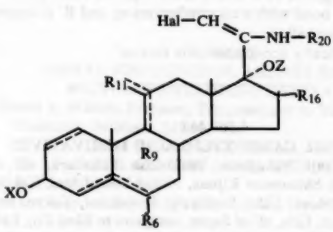
Filed Feb. 3, 1984, Ser. No. 576,590
Int. Cl.³ C07J 5/00
U.S. Cl. 260—397.45 **19 Claims**

1. A steroid selected from the group consisting of a 21-halo-enimide of the formula



(XV A-C)

and a 21-halo-Δ^{20}-enamide of the formula



(XX A-C)

and C_3 protected forms thereof where

R_6 is a hydrogen or fluorine atom or methyl group;

R_9 is nothing, a hydrogen, fluorine or oxygen atom which makes the C ring

(a) $\Delta^{9(11)}$ when R_9 is nothing and

(b) $9\beta,11$-epoxide when R_9 is an oxygen atom;

R_{11} is a hydrogen or oxygen atom, two hydrogen atoms, or α- or β-hydroxyl group which makes the C-ring

(a) $\Delta^{9(11)}$ when R_{11} is a hydrogen atom,

(b) $9\beta,11\beta$-epoxide when R_{11} is an oxygen atom and ···· between C_{11} and R_{11} is a single bond, and

(c) a ketone when R_{11} is an oxygen atom and ···· between C_{11} and R_{11} is a double bond;

R_{16} is a hydrogen atom or methyl group;

R_{20} is —OC—R_{20}' or —R_{20}'';

R_{20}' is alkyl of 1 thru 5 carbon atoms, phenyl, phenyl substituted 0 thru 2 chlorine atoms, methyl or nitro groups;

R_{20}'' is —$Si(CH_3)_3$ or —$SI(CH_3)_2C(CH_3)_3$;

X refers to a hydrogen atom or nothing;

Z is selected from the group consisting of a TMS, THP, methoxymethyl, t-butyl-dimethyl silyl and EEE group;

···· is a single or double bond;

~ indicates that the attached atom or group can be in either the a or β configurations; and

Hal is a chlorine, bromine, iodine, atom.

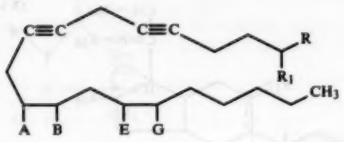
4,500,462

UNSATURATED EICOSANOIC ACIDS

Ka-Kong Chan, Hopatcong; George W. Holland, and Perry Rosen, both of North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 278,531, Jun. 29, 1981, Pat. No. 4,345,084. This application Jun. 1, 1982, Ser. No. 383,445
Int. Cl.³ C09F 5/00, 5/06; C11C 3/02, 1/00
U.S. Cl. 260—405.5 **10 Claims**

1. A compound of the formula



wherein R is —COOR′,

R_1 is hydrogen or fluoro; A and B are individually hydrogen or taken together form a carbon to carbon bond with a cis configuration: E and G are individually hydrogen or taken together form a carbon to carbon bond with a cis configuration with the proviso that at least one of A and B taken together or E and G taken together form a carbon to carbon bond with a cis configuration; and R′ is hydrogen or lower alkyl;

or pharmaceutically acceptable salts thereof.

4,500,463

POLYPRENYL CARBOXYLIC ACID DERIVATIVES

Akio Sato; Kenji Nakajima; Yoshimasa Takahara, all of Yatabemachi; Shizumasa Kijima, Niiza; Yuichi Inai, Tokyo; Yoshiyuki Kohara, Gifu; Yoshiyuki Kawakami, Tokyo, and Tomio Tsurugi, Gifu, all of Japan, assignors to Eisai Co., Ltd. and Agency of Industrial Science & Technology, both of Tokyo, Japan

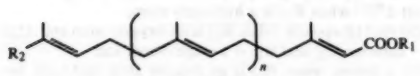
Filed May 1, 1981, Ser. No. 259,772

Claims priority, application Japan, May 19, 1980, 55-66203

Int. Cl.[3] **C07C** *57/13, 59/42, 59/74, 69/602, 69/73, 69/732*

U.S. Cl. 260—406 **14 Claims**

1. A polyprenyl carboxylic acid derivative having the formula (I):



(I)

in which n is an integer of from 2 to 4, R_1 is hydrogen or an ester-forming moiety effective as a protecting group for a carboxyl group selected from the group consisting of alkyl, alkenyl, cycloalkyl and aryl, and R_2 is hydroxymethyl, formyl or carboxyl.

4,500,464

COPPER AND MANGANESE RECOVERY FROM C_5–C_9 SATURATED ALIPHATIC MONOCARBOXYLIC ACIDS

Olan S. Fruchey, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 15, 1983, Ser. No. 466,447

Int. Cl.[3] **C11C** *1/00;* **C07F** *1/08, 11/00*

U.S. Cl. 260—413 **9 Claims**

1. A process for removing copper and manganese from a water immiscible organic phase comprising a saturated aliphatic monocarboxylic acid containing from 5 to 9 carbon atoms which comprises adding to said monocarboxylic acid an aqueous formic acid solution containing from about 2 to about 20 weight percent formic acid in a sufficient amount for the substantially complete reaction of the copper and manganese metals with formic acid to cupric formate and manganous formate; extracting said formates from said monocarboxylic acid into the resulting aqueous phase which separates an organic phase containing said monocarboxylic acid; decanting said organic phase and recovering from it said monocarboxylic acid substantially free of copper and manganese.

4,500,465

SOLUBILIZED PLATINUM (II) COMPLEXES

Alan R. Amundsen, Somerville, and Eric W. Stern, Mountainside, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Jun. 28, 1982, Ser. No. 392,818

Int. Cl.[3] **C07F** *15/00*

U.S. Cl. 260—429 R **4 Claims**

1. A platinum-amine compound of the formula: cis[Pt$(A)_2(X)_2$] wherein A represents a polyhydroxylated amine and A_2 represents a polyhydroxylated diamine, and A and A_2 are selected from among

2-methyl-2-amino-1,3-propanediol,
tris(hydroxymethyl)methylamine,
2,3-dihydroxypropylamine,
2,2,2-tris(hydroxymethyl)ethylamine,
2-amino-2-ethyl-1,3-propanediol,
2,3,4,5,6-pentahydroxyhexylamine,
3,3,3-tris(hydroxymethyl)propylamine,
1,2-diamino-4,5-dihydroxycyclohexane,
1,2-diamino-3,4,5-trihydroxycyclopentane,
2-(tris(hydroxymethyl)methyl)-1,3-diaminopropane
2,3-bis(hydroxymethyl)ethylenediamine;

and the X radicals are anionic ligands selected from the group consisting of halo, carboxylato or, taken together, the X radicals represent dicarboxylato, sulfato, orthophosphato, or pyrophosphato, or a combination of aquo and sulfato, orthophosphato or pyrophosphato.

4,500,466

METHOD FOR PREPARING A ZINC DIMETHACRYLATE POWDER HAVING A SPECIFIC SURFACE AREA RANGE

Robert A. Hayes, Cuyahoga Falls, and Wendell R. Conard, Kent, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 421,012, Sep. 21, 1982, abandoned. This application Oct. 20, 1983, Ser. No. 543,705

Int. Cl.[3] **C07F** *3/06;* **C08K** *3/04;* **C08L** *7/00;* **C08F** *275/00*

U.S. Cl. 260—429.9 **6 Claims**

1. A method of preparing a zinc dimethacrylate powder having a surface area of from about 3.7 to about 5.4 m^2/g which comprises:

(a) reacting under agitation zinc oxide and methacrylic acid in an amount of from about 0.5 to about 0.6 moles of zinc oxide per mole of methacrylic acid in a liquid aliphatic hydrocarbon dispersing medium to produce particles of zinc dimethyacrylate in the liquid medium;

(b) recovering said particles of zinc dimethacrylate from said liquid medium by filtration or evaporation of the liquid medium; and

(c) drying said particles of zinc dimethacrylate to produce said zinc dimethacrylate powder.

4,500,467

BENZOYLTHIO COMPOUNDS, THEIR PREPARATION AND THEIR USE AS DRUGS

Hugo Kubinyi, Weisenheim; Martin Traut, Heidelberg, and Josef Gries, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellscaft, Ludwigshafen, Fed. Rep. of Germany

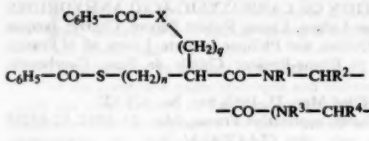
Filed Nov. 21, 1983, Ser. No. 554,098

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243370

Int. Cl.[3] **C07C** *153/00, 103/52;* **C01B** *25/10*

U.S. Cl. 514—2 **5 Claims**

1. An angiotensin converting enzyme inhibitor which is selected from the group consisting of benzoylthio compounds of the formula



wherein

R^1 and R^3 are identical or different and are each hydrogen or C_1–C_4alkyl;

R^2 and R^4 are identical or different and are each hydrogen;

C_1–C_6 alkyl which is unsubstituted or substituted by hydroxyl, mercapto, C_1–C_4 alkylthio, a carboxylic ester group, carboxamido, or acylamino;

aryl;

hetaryl;

arylakylene; or

hetarylalkylene radical which is unsubstituted or substituted in the aryl moiety by hydroxyl,

C_1–C_4 alkoxy, arylalkoxy, or halogen; with the proviso that R^1 and R^4 together or R^3 and R^4 together may furthermore be a radical selected from

$-(CH_2)_p-$, wherein p is 2–4,

$-CH_2-S-CH_2-$, or

ortho—$CH_2-C_6H_4-CH_2-$;

X is NH or sulfur;

m and n are identical or different and are each 0 or 1; and

q is 0;

or a salt of said inhibitor with a physiologically acceptable base.

4,500,468

CATALYTIC DIMERIZATION OF ACRYLONITRILE

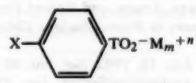
James D. Burrington, Richmond Hts., and Marc W. Blachman, Lyndhyrst, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 21, 1983, Ser. No. 554,088

Int. Cl.³ C07C *121/30, 120/00*

U.S. Cl. 260—465.8 D **23 Claims**

1. A process for making α-methyleneglutaronitrile which comprises dimerizing acrylonitrile in the presence of a catalytic amount of a sulfinate or selenate catalyst having the formula



where M is an alkali metal or an alkaline earth metal, T is S or Se, n is 1 or 2, m is 0.5 or 1, n×m=1, and X is selected from H—, nitro, methyl, methoxy and halo.

4,500,469

METAL ION CONTROL COMPOUNDS BASED ON NORBORNANE

Jaime Simon, Angleton; Druce K. Crump, Lake Jackson, and David A. Wilson, Richwood, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 27, 1984, Ser. No. 584,071

Int. Cl.³ C07F *9/38*; C07C *143/21, 61/12, 87/40*

U.S. Cl. 260—502.5 E **11 Claims**

1. Compounds having the structural formula:

wherein substituents A, B, X and Y each are independently selected from radicals consisting of hydrogen, hydroxyalkyl (wherein the alkyl group contains 2–6 carbon atoms), methylenephosphonic; methylene-, ethylene- and propylenesulfonic 2-hydroxypropyl-sulfonic and alkylcarboxylic acid radicals (having 2–4 carbon atoms) and the alkali, alkaline earth metal, ammonium and amine salts of any of the phosphonic, sulfonic or carboxylic acid derivatives, and wherein at least one of the substituents is other than hydrogen.

4,500,470

METAL ION CONTROL AGENTS BASED ON DICYCLOPENTADIENE DERIVATIVES

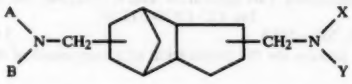
David A. Wilson, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 18, 1983, Ser. No. 486,122

Int. Cl.³ C07C *143/21*; C07F *9/38*

U.S. Cl. 260—502.5 E **11 Claims**

1. Compounds having the structural formula:



wherein substituents A, B, X and Y each are independently selected from radicals consisting of hydrogen, hydroxyalkyl (wherein the alkyl group contains 2–6 carbon atoms) hydroxyethyl- and hydroxypropyl sulfonic, methylenephosphonic, methylene-, ethylene- and propylenesulfonic, alkylcarboxylic acid radicals (having 2–4 carbon atoms) and the alkali or alkaline earth metal, ammonia and amine salts thereof and wherein at least one A, B, X and Y is other than hydrogen.

4,500,471

PREPARATION OF TRIFLUOROMETHYL-BENZOYL HALIDES

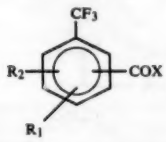
Byron R. Cotter, Grand Island, and David Y. Tang, Amherst, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Apr. 16, 1980, Ser. No. 140,894

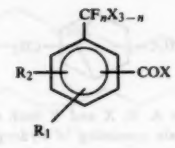
Int. Cl.³ C07C *63/10*

U.S. Cl. 260—544 D **17 Claims**

1. A process for the preparation of trifluoromethylbenzoyl halides of the formula



wherein X is chlorine or bromine and R_1 and R_2 are independently selected from the group consisting of hydrogen, fluorine, chlorine, bromine, alkyl, aryl, haloaryl, alkoxy, fluoroalkoxy, aryloxy, haloaryloxy, nitro, cyano, sulfonyl, and carboxylic acid chloride, which comprises reacting a compound of the formula



wherein X, R_1 and R_2 are as stated above, and n is 0 to 2 with about three moles or less of hydrogen fluoride in the presence of a halogen transfer catalyst.

4,500,472

PROCESS FOR PREPARING IMIDAZOBENZOTHIADIAZEPINES

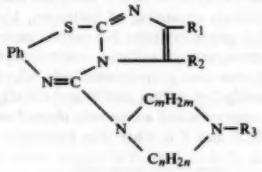
Isidoros Vlattas, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 259,261, May 11, 1981, Pat. No. 4,391,808, which is a continuation-in-part of Ser. No. 158,671, Jun. 12, 1980, abandoned. This application Aug. 9, 1982, Ser. No. 406,760

Int. Cl.³ C07D *513/07*

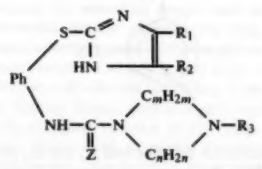
U.S. Cl. 260—245.5 **3 Claims**

1. A process for the preparation of a compound of the formula



(I)

wherein each of R_1 and R_2 is hydrogen, lower alkyl or alkanoyl, halogeno, cyano, carboxy, lower carbalkoxy, carbamoyl, sulfamoyl, mono- or di-lower alkyl-(carbamoyl or sulfamoyl); Ph is 1,2-phenylene, unsubstituted or substituted by up to two members selected from lower alkyl, lower alkoxy, lower alkylthio, halogeno, trifluoromethyl, sulfamoyl, mono- or di-lower alkylsulfamoyl; each of C_mH_{2m} and C_nH_{2n} is lower alkylene separating both nitrogen atoms by 2 or 3 carbon atoms; and R_3 is hydrogen, lower (alkyl, alkanoyl, alkoxycarbonyl, phenylalkoxycarbonyl or hydroxyalkyl wherein the hydroxy group is separated from the nitrogen atom by at least 2 carbon atoms); consisting of ring-closing a compound of formula V



(V)

wherein z is oxygen and the other symbols have the above-given meaning, under dehydrating conditions using dehydrating agents comprising phosphorous halides and phosphorous oxyhalides.

4,500,473

PREPARATION OF CARBOXYLIC ACID ANHYDRIDES

Jean Gauthier-Lafaye, Lyons; Robert Perron, Charly; Jacques Gallucci, Oullins, and Philippe Leconte, Lyons, all of France, assignors to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Mar. 23, 1983, Ser. No. 478,033

Claims priority, application France, Mar. 23, 1982, 82 05268

Int. Cl.³ C07C *51/56*

U.S. Cl. 260—548 **20 Claims**

1. A process for the preparation of a carboxylic acid anhydride having the general formula:

$$RCO—O—COR' \quad (I)$$

in which R is a linear alkyl radical having at most 4 carbon atoms and R′ independently is a linear or branched chain alkyl radical having from 1 to 12 carbon atoms, a phenyl radical (C_6H_5-), a radical $C_6H_5—C_xH_{2x}—$ or a radical $C_xH_{2x+1}—C_6H_4—$, with x being an integer ranging from 1 to 6, which process comprises:

reacting, in an essentially anhydrous, liquid phase containing an aprotic organic solvent:

(i) a compound of the formula:

$$RX \quad (II)$$

in which R is as above-defined and X is an iodine atom or a group $R''—SO_3—$, with R″ being an alkyl, aryl or aralkyl radical having at most 10 carbon atoms;

(ii) a carboxylate of the formula:

$$(R'COO^-)_nA^{n+} \quad (III)$$

in which R′ is as above-defined, n is an integer ranging from 1 to 4, and A^{n+} is an alkali metal cation, an alkaline earth metal cation, a cation $N^+R^1R^2R^3R^4$ or a cation $P^+R^1R^2R^3R^4$, in which R^1 to R^4, which may either be identical or different, each have the definition given above for R′, or may be a cycloalkyl radical having from 3 to 8 carbon atoms, the cation Mn^{++}, the cation Zn^{++}, or a cation of a metal from the lanthanide or actinide group of the Periodic Table; and

(iii) carbon monoxide; said reaction being carried out in the presence of a catalyst comprising a salt of cobalt tetracarbonyl hydride, at a temperature ranging from 0° and 200° C., and under a pressure which is less than or equal to 600 bars.

4,500,474

CARBONYLATION OF METHYL ACETATE

Jean Gauthier-Lafaye, Lyons, and Robert Perron, Charly, both of France, assignors to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Jun. 11, 1982, Ser. No. 387,467

Claims priority, application France, Jun. 12, 1981, 81 11787

Int. Cl.³ C07C *51/12*

U.S. Cl. 260—549 **20 Claims**

2. In a process for the carbonylation of methyl acetate to produce acetic anhydride in homogeneous liquid phase, the improvement which comprises conducting such carbonylation in a virtually anhydrous medium, in the presence of:

(a) a cobalt source;

(b) a rutheium source;

(c) an ionic iodide of the formula:

$$A^{m+}I_m^-$$

in which A^{m+} is a nitrogen group quaternary onium cation, an alkali metal cation, an alkaline earth metal cation, a cation of a lanthanide group metal or a cation of an actinide group metal, with m being 1, 2, 3 or 4;

(c′) a carboxylate of the formula:

$$A'^{n+}(OCOR)_n^-$$

in which n is 1, 2, 3 or 4 and A'^{n+} is defined as was A^{m+}, with A'^{n+} and A^{m+} being the same or different, an R is an alkyl, aralkyl or aryl radical having a maximum of 8 carbon atoms; and

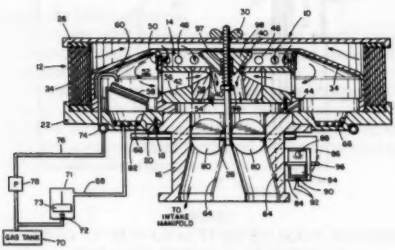
(d) hydrogen, as an amount of at least about 1 mole percent of the combined gases hydrogen and carbon monoxide;

with the total amount of halogen compounds present in the reaction medium, expressed in gram atoms of halogen and designated by X_T, being such that the atomic ratio $X_T/(A^{m+}+n.A'^{n+})$ is less than or equal to 1.

4,500,475
CARBURETION SYSTEM

Gabor Csaszar, 8414 Russell Dr., Cary, Ill. 60013; Gernot F. Oehley, 6650 Harts Rd., Niles, Ill. 60648, and Fred M. Goldman, 624 Huber Ln., Glenview, Ill. 60025

Filed Nov. 30, 1983, Ser. No. 556,462
Int. Cl.³ F02M *27/08*
U.S. Cl. 261—36 A **9 Claims**



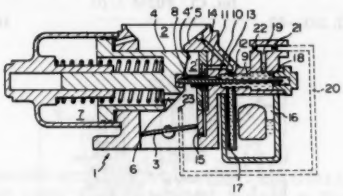
1. A combination gas vaporizer-air filter comprising a housing, fuel supply means for fluid to be vaporized, an ultrasonic transducer in the housing for vaporizing fluid from said fuel supply means, air inlet means in the housing, outlet means in the housing, an air filter in said housing adjacent the air inlet means, the vaporized fluid and air in the housing being intimately mixed prior to discharge from the outlet means, duct means communicating said housing to the intake manifold of an internal combustion engine, the outlet means communicating with said duct means, whereby the mixture of vaporized fluid and air may pass from the outlet means to said duct and then to said intake manifold, venturi means in said housing, said venturi means being disposed in the air passage through said housing downstream from said ultrasonic transducer, and a gas collector body in said housing, said gas collector body having ports in the internal walls thereof and a central opening therethrough, said venturi means including a venturi housing disposed in said central opening.

4,500,476
VARIABLE VENTURI TYPE CARBURETOR

Mitsuyoshi Teramura; Masatami Takimoto, both of Toyota; Norihiko Nakamura, Mishima; Takaaki Itoh, Mishima; Takashi Katou, Mishima, and Yukinori Isoya, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obu, both of, Japan

Filed Sep. 29, 1982, Ser. No. 428,034
Claims priority, application Japan, Dec. 24, 1981, 56-207989
Int. Cl.³ F02M *9/06*
U.S. Cl. 261—44 C **2 Claims**

1. A variable-venturi-type carburetor having an intake passage therethrough; a suction piston movable in the intake passage; a substantially horizontally extending main fuel passage having a first end and a second blind end, said second blind end located at a position in said main fuel passage opposite to said first end; a metering jet arranged adjacent to the first end of said main fuel passage for interconnecting the main fuel passage to the intake passage; a slow fuel passage having a fuel inlet which is open to the main fuel passage near said metering jet, said slow fuel passage having a fuel outlet which is open to the intake passage; a metering needle fixed onto the suction piston and extending into the metering jet for metering fuel fed into the intake passage from the main fuel passage; said main fuel passage having a vertically enlarged portion formed between the inlet of the slow fuel passage and the second blind

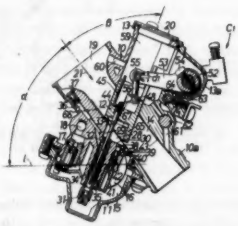


end; a fuel vapor conduit, said fuel vapor conduit having a fuel vapor outlet which is open to the intake passage; and an upwardly oriented, T-shaped inlet port for said fuel vapor conduit, said inlet port being open to the main fuel passage at said vertically enlarged portion, one lateral port of said T-shaped inlet port being connected to the fuel vapor conduit, the other lateral port being connected to atmospheric pressure.

4,500,477
SLIDING THROTTLE VALVE TYPE CARBURETOR

Katsuyuki Zaita, Kawagoe, and Michio Tahata, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1983, Ser. No. 546,502
Claims priority, application Japan, Nov. 4, 1982, 57-193809
Int. Cl.³ F02M *9/06*
U.S. Cl. 261—44 B **23 Claims**



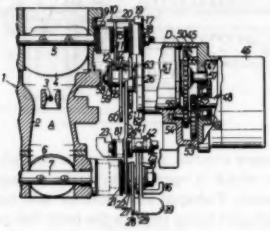
1. A sliding throttle valve type carburetor comprising a sliding throttle valve, an air intake passage and a fuel float chamber, said sliding throttle valve extending along a line of intersection with said intake passage and being disposed at an acute angle relative to the portion of said intake passage upstream from said sliding throttle valve, said sliding throttle valve forming an angle of intersection with the portion of the fuel surface in said float chamber upstream from said sliding throttle valve which is greater than said acute angle.

4,500,478

SUPPORTING APPARATUS FOR CARBURETOR CONTROLLING CAM PLATE

Nobuyuki Furukawa, Asaka, and Mitsuhiro Sanbe, Kiyose, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,807
Claims priority, application Japan, Oct. 5, 1982, 57-174744
Int. Cl.³ F02M *1/10*
U.S. Cl. 261—52 **16 Claims**



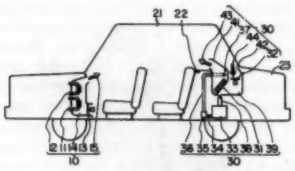
1. Apparatus comprising a carburetor including a choke valve and a throttle valve, a controlling prime mover, a driving shaft rotated by said prime mover, first and second cam plates for controlling the opening of said choke valve, a third cam plate for controlling the opening of said throttle valve, each said cam plate being supported on said driving shaft, a displacement detection plate on said driving shaft for detecting rotational displacement of said cam plates, and a phase shift preventing means, said cam plates for the choke valve, said cam plate for the throttle valve and said displacement detection plate being fixed to each other by said phase shift preventing means so as to avoid producing a relative phase shift between the same.

4,500,479

HUMIDIFIER

Akira Fukami, Okazaki; Hiroki Noguchi, Oobu, and Hiroshi Hamaguchi, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 2, 1982, Ser. No. 404,488
Claims priority, application Japan, Sep. 9, 1981, 56-142008
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—98 **4 Claims**



1. An automobile humidifier mounted behind the passenger compartment of an automobile provided with conventional air conditioning means having air heating and cooling functions, said humidifier comprising:

an air duct mounted behind the passenger compartment of an automobile and having an air inlet and an air outlet from and to, respectively, the compartment;

a humidifier element in said duct having air passages therethrough, the walls of which are constructed of high water absorbing material, said passages being adapted to be inclined downward, said element having a laminated structure comprising alternating non-corrugated sheet material and corrugated spacer sheet material of highly water absorbable paper containing activated carbon fibers;

a blower disposed in said duct for blowing air through said passages;

nozzle means for applying water into the upper ends of said passages; and

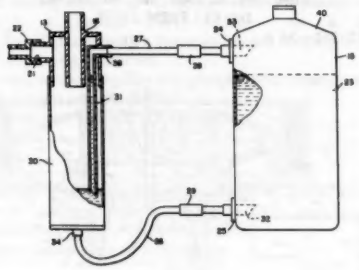
means for supplying said nozzle means with water.

4,500,480

PEDIATRIC CARTRIDGE HUMIDIFIER

Orlando D. Cambio, Jr., Bristol, Wis., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Continuation of Ser. No. 410,626, Aug. 23, 1982, abandoned.
This application Nov. 7, 1983, Ser. No. 549,075
Int. Cl.³ B01F *3/04*; A61M *15/00*
U.S. Cl. 261—104 **12 Claims**



1. A feeder circuit for delivering a liquid from a reservoir to a cartridge module, said cartridge module having a top portion and a bottom portion, comprising, in combination:

support means for securing said reservoir in fixed relationship to said cartridge module;

a first conduit connecting said bottom portion of said cartridge module to said reservoir;

first valve means interconnected in said first conduit for permitting passage of fluid from said reservoir to said cartridge module;

a fluid level sensing tube extending into said cartridge module through said top portion and extending therein towards said bottom portion, said fluid level sensing tube having a first end external to said cartridge module and a second end within said cartridge module, said second end of said fluid level sensing tube substantially defining a fluid control level within said cartridge module;

a second conduit connecting said first end of said fluid level sensing tube and said reservoir; and

second valve means interconnection in said second conduit for permitting passage of fluid from said cartridge module to said reservoir;

said support means, said first conduit, said first valve means, said fluid level sensing tube, said second conduit, and said second valve means cooperatively defining fluid level means for maintaining the level of said liquid within said cartridge module substantially at said fluid control level.

4,500,481

METHODS FOR CONTROLLING VINYL PLASTIC EXTRUDATE

Morris F. Marx, III, Dunwoody, Ga., assignor to AT&T Technologies, Inc., New York, N.Y.

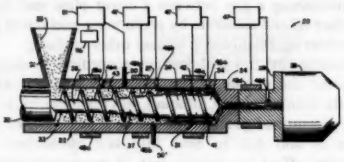
Filed Apr. 25, 1983, Ser. No. 488,312
Int. Cl.³ B29F *3/08*
U.S. Cl. 264—40.6 **6 Claims**

1. A method of providing a substantially homogenous extrudate of a plastic material which comprises a polyvinyl chloride composition having a fusion characteristic which may

vary between supplies thereof, said method comprising the steps of:

feeding pellets of the polyvinyl chloride plastic material into a feed section of an extruder screw and barrel arrangement;

rotating the screw to convey the pellets from the feed section through a compression section and a metering section to an extruder crosshead where the plastic material is caused to be extruded into a predetermined cross-sectional shape; while



heating the plastic material;

measuring the melt pressure of the heated plastic material between the feed section and the metering section of the extruder screw; and

in response to the measured melt pressure, adjusting the heat energy which is imparted to the plastic material at least prior to the compression section to cause the plastic material that is moved from the barrel to the crosshead to be substantially homogenous.

4,500,482

METHOD OF MANUFACTURE SILICON NITRIDE CERAMIC MOLDED ARTICLES

Werner Hüther, Karlsfeld, Fed. Rep. of Germany, assignor to Motoren-Und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 11, 1980, Ser. No. 129,452

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910943

Int. Cl.³ C04B *35/64*

U.S. Cl. 264—65 **6 Claims**

1. A method of manufacturing silicon nitride ceramic molded articles comprising the steps of:

(a) providing a powdery mixture of silicon, α-silicon nitride, and a sintering agent,

(b) molding a blank from the powdery mixture,

(c) nitriding the silicon content of the blank, and

(d) thereafter subjecting the blank to hot isostatic pressing.

4,500,483

MANUFACTURE OF HOLLOW CVD SILICON NITRIDE ARTICLES

Richard D. Veltri, East Hartford; Francis S. Galasso, Manchester, both of Conn., and Mel I. Mendelson, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 19, 1982, Ser. No. 379,827

Int. Cl.³ B29C *13/00*

U.S. Cl. 264—81 **5 Claims**

1. In the manufacture of a hollow article of silicon nitride the steps of:

making a carbon pattern for the article;

heating the pattern to between 1400° and 1500° C. in a gaseous atmosphere of silicon tetrafluoride and ammonia to combine with the silicon tetrafluoride and to deposit a coating of silicon nitride on the pattern;

removing the pattern and coating from the gaseous atmosphere;

removing an area of the coating to form an opening to expose the pattern; and

burning out the pattern by heating the coated pattern to between 650° and 750° C. in an oxidizing atmosphere for several hours to cause reaction of the carbon with the oxygen in the atmosphere.

4,500,484

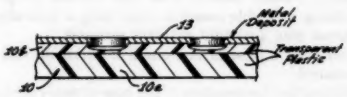
PROCESS FOR MAKING A VIDEO RECORD DISC

David P. Gregg, Los Angeles, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 936,982, Aug. 25, 1978, abandoned, which is a division of Ser. No. 812,157, Jul. 1, 1977, abandoned, which is a division of Ser. No. 571,259, Apr. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 735,007, Jun. 6, 1968, abandoned. This application Jul. 16, 1982, Ser. No. 399,075

Int. Cl.³ B29D *17/00*

U.S. Cl. 264—107 **18 Claims**



1. A method for forming a plastic record disc having a spiral-shaped recording track that includes a succession of alternating regions of optical contrast having variable lengths, the method comprising the steps of:

providing a disc-shaped unitary structural die member having a planar surface for carrying an information signal in an information track formed by a plurality of circumferentially spaced rasied members extending away from the plane of the planar surface and terminating in a common plane spaced from said planar surface, and wherein said information track is in the form of a spiral having a plurality of turns, each of said turns is separated from an adjacent one of said turns by an intertrack portion of said planar surface, the information track includes a plurality of alternately positioned first and second regions arranged in sequential order, each of said first regions is formed from a portion of said planar surface such that each of said first regions is coplanar with said intertrack portions of said planar surface, each of said first regions is located intermediate two of said second regions, each of said second regions is defined by one of said spaced members and formed with a constant dimension in the radial direction of the disc-shaped member and a constant maximum dimension in the direction perpendicular to said first surface, and each of said second regions is formed with a variable length representative of the information signal;

heating said die member;

moving a body of heated plastic into compressive engagement against said die to form a record disc having a planar recording surface with a spiral-shaped recording track that includes a succession of alternating regions of optical contrast having variable lengths;

cooling the die during said period of compressive engagement such that the record disc retains the recording track in the disc when removed from said die; and

releasing said compressive engagement.

4,500,485

METHOD FOR THE PRODUCTION OF A HOSE OF A SHAPE-CURED ELASTOMERIC MATERIAL, SUCH AS VULCANIZED RUBBER, ESPECIALLY AN AUTOMOTIVE RADIATOR COOLANT HOSE

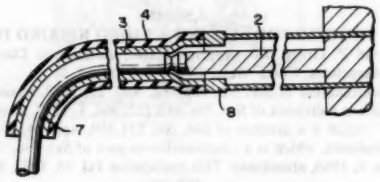
Henricus P. Willemsen, Aarle-Rixtel; Leonardus M. A. Vaessen, and Rudolf J. G. A. van der Hoorn, both of Nuenen, all of Netherlands, assignors to Vredestein N.V., Velp, Netherlands

Filed Jul. 28, 1983, Ser. No. 518,223

Claims priority, application Netherlands, Aug. 2, 1982, 8203075

Int. Cl.³ B29H *5/01*

U.S. Cl. 264—313 **3 Claims**



1. A method for the production of a hose of a shape-cured elastomeric material, such as vulcanized rubber, especially an automotive radiator coolant hose, said method comprising:

(a) sliding a flexible mandrel comprising a helically wound thread onto a straight auxiliary mandrel;

(b) bringing a hose of non-cured material on said flexible mandrel;

(c) sliding the combination of the hose of non-cured material and said flexible mandrel off the straight auxiliary mandrel and onto an inner mandrel portion having the finally desired configuration of the hose;

(d) curing said hose present on the flexible mandrel and on the inner mandrel portion;

(e) sliding the flexible mandrel together with the cured hose off said inner mandrel portion;

(f) bringing the flexible mandrel together with the cured hose onto a straight auxiliary mandrel; and

(g) sliding the hose off said flexible mandrel.

4,500,486

METHOD FOR REMOVAL OF A DATA CARRIER DISK AFTER MOLDING

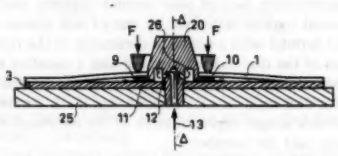
Roger Rascle, and Francois Lange, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 2, 1982, Ser. No. 414,310

Claims priority, application France, Oct. 6, 1981, 81 18788

Int. Cl.³ B29C *7/00*; **B29D** *31/00, 11/00, 17/00*

U.S. Cl. 264—335 **7 Claims**



1. A method for removal from a planar disk-shaped clamping die a molded record disk made of a planar substrate coated with a layer of hardened molding agent sticking both to said substrate and to a recorded surface of said stamping die, carrying in an annular area a relief impression of surface irregularities which are copied into said layer prior to said removal and wherein said molding agent is arranged intermediate between said substrate and said stamping die, said method comprising the steps of:

(a) clamping an outer annular portion of the molded record disk against the recorded surface to form a seal at said outer portion and to thereby establish, between said recorded surface and one surface of said substrate, an air-tight inflatable chamber which includes said annular area;

(b) establishing fluid communication with said inflatable chamber by means of a duct having an opening which terminates at a position in said inflatable chamber;

(c) establishing a gap between a cover plate and the other surface of said substrate by positioning said cover plate in confronting relationship to said other surface;

(d) maintaining the seal formed according to step (a) to prevent the escape of gas from the inflatable chamber while simultaneously inflating said chamber by introducing pressurized gas through the duct to cause the annular area of said disk to bend into said established gap to thereby effect an annular loss of contact between said annular area and said molded record disk; and

controlling the amount of said bending by maintaining the gap formed according to step (c).

4,500,487

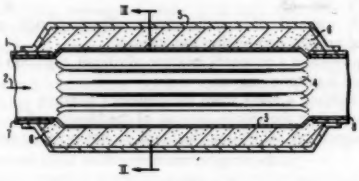
PRESSURE SURGE ATTENUATOR

Alan M. Christie, Swissvale, and Kurt I. Snyder, Murrysville, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 26, 1982, Ser. No. 352,603

Int. Cl.³ G21C *9/00*; **F16L** *9/04, 9/18*

U.S. Cl. 376—283 **4 Claims**



1. A pressure surge attenuating system for piping which carries liquid coolant for a nuclear reactor and which attenuating system is operable to attenuate maximum expected pressure surges while maintaining the integrity of said piping to prevent escape of coolant from said piping, said attenuating system comprising:

a pipe section of said piping having a wall portion with a fluted cross-sectional configuration which can deform by radially expanding without plastic deformation under pressure surges which could be hazardous;

an enlarged container surrounding said fluted wall pipe section and spaced from said fluted wall pipe section; and

a crushable metal foam filling the space between said fluted wall pipe section and said surrounding container, said crushable metal foam exhibiting controlled energy absorption upon crushing thereof, and said pressure surge attenuating system operable to attenuate the maximum expected pressure surges which may be encountered while limiting the expansion of said fluted wall section so that it does not exhibit plastic deformation.

4,500,488

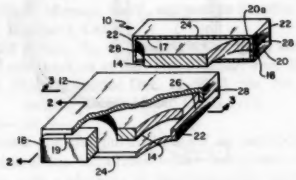
ENCAPSULATED FUEL UNIT AND METHOD OF FORMING SAME

Edward F. Groh, Naperville, Ill.; Dale A. Cassidy, Valparaiso, Ind., and Edward F. Lewandowski, Westmont, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 7, 1982, Ser. No. 415,117

Int. Cl.³ G21C *3/04*

U.S. Cl. 376—409 **8 Claims**



1. An encapsulated nuclear fuel unit having very low thickness-to-width and thickness-to-length ratios, comprising a piece of nuclear fuel sized approximately between 1 and 2 inches in width, 1 and 4 inches in length, and only 1/64 and ¼ of an inch in thickness; and a rigid housing virtually enclosing and encapsulating the fuel piece, said housing having an open-ended body section defining an interior opening just slightly larger than the cross section of the fuel piece thereby being operable to receive the fuel piece and being elongated lengthwise to extend beyond the fuel piece, the body section being formed as two C-shaped channel pieces each having an intermediate wall and two short legs angled substantially normal thereto and welded together along opposite butted edges extended along the narrow sides of the body section and being of an impervious material between 0.002 and 0.01 of an inch thick, and said housing having rigid but porous end caps secured across and closing the open ends of the body section outwardly of the fuel piece.

4,500,489

HIGH TEMPERATURE PROTECTIVE COATING ALLOY

Andrew R. Nicoll, Oftersheim, Fed. Rep. of Germany, assignor to BBC Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Nov. 30, 1982, Ser. No. 445,714

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 3148198

Int. Cl.³ C22C *19/05*

U.S. Cl. 420—445 **2 Claims**

1. A high temperature protective coating alloy consisting essentially of aluminum in 4–5.1 % by weight, silicon in 1.1–3.2% by weight, chromium in 17.2–17.8% by weight, iron at about 4.5% by weight, boron at about 3.5% by weight, the balance being nickel.

4,500,490

CATALYTIC ALKYLATION OF HYDROCARBONS

Thomas Hutson, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 027,322, Apr. 5, 1979, Pat. No. 4,304,947. This application Aug. 26, 1981, Ser. No. 296,090

Int. Cl.³ G01N *33/00, 14/00*

U.S. Cl. 422—62 **17 Claims**

1. Apparatus for alkylating at least one alkylatable hydrocarbon with two different alkylating agents in the presence of an acid-type catalyst comprising:

(a) a first alkylation reactor system, including;

(1) a first alkylation reactor means;

(2) alkylatable hydrocarbon introduction means adapted to introduce an alkylatable hydrocarbon into said first reactor;

(3) first alkylating agent introduction means adapted to introduce a first alkylating agent into said first reactor;

(4) first separator means operatively connected to the effluent end of said first reactor and adapted to separate said effluent into a first alkylate phase and a first acid phase; and

(5) first catalyst recycle means operatively connected to said first separator to receive said first acid phase and pass said first acid phase from said first separator to said first reactor;

(b) a second alkylation reactor system, including;

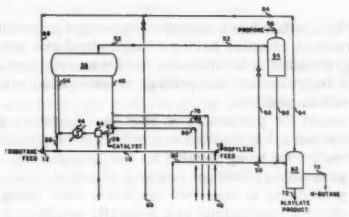
(1) second alkylation reactor means;

(2) alkylatable hydrocarbon introduction means adapted to introduce an alkylatable hydrocarbon into said second reactor;

(3) second alkylating agent introduction means separate from said first alylating agent introduction means and adapted to introduce a second alkylating agent into said second reactor;

(4) second separator means operatively connected to the effluent end of said second reactor and adapted to separate said effluent into a second alkylate phase and a second acid phase; and

(5) second catalyst recycle means operatively connected to said second separator means to receive said second acid phase and pass said second acid phase from said second separator means to said second reactor means;



(c) at least one catalyst exchange means operatively connecting said first catalyst recycle means and said second catalyst recycle means;

(d) acid soluble oil generation means operatively connected to at least one of said first catalyst recycle means, said second catalyst recycle means and said catalyst exchange means;

(e) said acid soluble oil generation means, includes; a third alkylating agent introduction means, operatively connected to said acid soluble oil generation means and a source of alkylating agent, olefinic hydrocarbon introduction means, operatively connected to said acid soluble oil generation means and a source of at least one olefinic hydrocarbon, other than said first and second alkylating agents, and acid-type catalyst introduction means, operatively connected to said acid soluble oil generation means and a source of supply of acid-type catalyst, said third alkylating agent introduction means, said olefinic hydrocarbon introduction means and said acid-type catalyst introduction means being the only means for introducing reactants to said acid soluble oil generation means;

(f) heating means operatively connected to said acid-soluble oil generation means; and

(g) control means to alternatively (1) open said third alkylating agent introduction means, close said olefinic hydrocarbon introduction means and actuate and increase the heat output of said heating means to a temperature significantly above the temperature of said first acid phase, said second acid phase or the acid present in said catalyst exchange means, to thereby produce acid soluble oil at a rate greater than that produced in said first and second alkylation

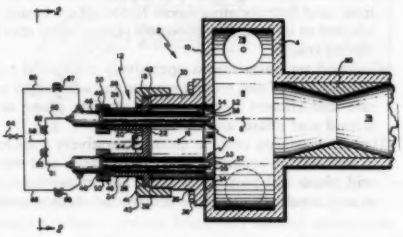
reactor means, and (2) open said olefinic hydrocarbon introduction means, close said third alkylating agent introduction means and actuate and increase the heat output of said heating means to a temperature sufficient to produce acid soluble oil in greater quantities than that produced in said first and second alkylation reactor means.

4,500,491

CHANGING OIL TUBES IN A CARBON BLACK REACTOR

Willie Tillman, Vinton, La., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 383,371, May 28, 1982, Pat. No. 4,418,049.
This application Jun. 13, 1983, Ser. No. 533,913
Int. Cl.³ C01B *31/02*; C09C *1/48*
U.S. Cl. 422—150 **5 Claims**



1. In a carbon black reactor comprising a generally cylindrical reaction chamber having a longitudinal axis, said chamber being bounded at its upstream end by an upstream end wall,

the improvement comprising, in association with the upstream end wall,

a means for positioning at least two feedstock tubes each having a longitudinal axis with the longitudinal axis of each tube being parallel to the longitudinal axis of the generally cylindrical reaction chamber, said means for positioning at least two feedstock tubes being rotatable about a longitudinal axis generally equidistant from and generally parallel to the longitudinal axes of the at least two feedstock tubes and being positioned so that each feedstock tube is revolvable into axial alignment with the longitudinal axis of the generally cylindrical reaction chamber.

4,500,492

APPARATUS AND METHOD TO KEEP THE WALLS OF A FREE-SPACE REACTOR FREE FROM DEPOSITS OF SOLID MATERIALS

Kazuo A. Yamakawa, Monterey Park, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 8, 1982, Ser. No. 415,879
Int. Cl.³ B08B *5/02*; C09C *1/28*
U.S. Cl. 422—199 **10 Claims**

1. An apparatus for producing a solid substance such as silicon by reaction of a precursor gas composition, said apparatus comprising:

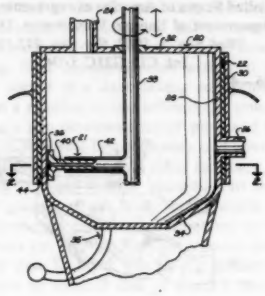
a reaction vessel having interior walls for containing the precursor gas composition;

gas inlet means for introducing the precursor gas composition into the reaction vessel;

gas outlet means for permitting excess gas composition and by-product gases to leave the reaction vessel;

solid substance removal means for permitting at least intermittent removal of the solid substance from the reaction vessel, and

wall cleaning means supported within the reaction vessel, said cleaning means including at least one rotating, telescopic head and means for ejecting a stream of cleaning gas from said at least one rotating, telescopic head so as to impinge upon the interior walls of the vessel, the impinging cleaning gas stream keeping at least a portion of the



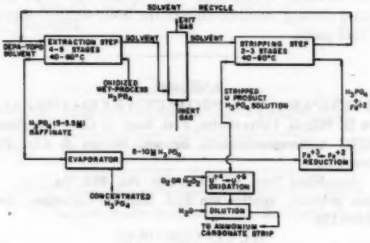
surface of the interior walls substantially free of deposits of the solid substance and further acting in combination with the static gas pressure to bias the rotating, telescopic head into close proximity to the interior walls.

4,500,493

REDUCTIVE STRIPPING PROCESS FOR URANIUM RECOVERY FROM ORGANIC EXTRACTS

Fred J. Hurst, Jr., Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1983, Ser. No. 504,904
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—10 **2 Claims**



1. A process for the recovery of uranium from a wet-process phosphoric acid solution derived from the acidulation of uraniferous phosphate ores, comprising:

(1) contacting said phosphoric acid solution with an organic extractant consisting essentially of di(2-ethylhexyl) phosphoric acid and trioctylphosphine oxide dissolved in an organic diluent, to thereby extract uranium from said phosphoric acid solution into said organic extractant;

(2) reductively stripping uranium from said organic extractant with a H_3PO_4 strip solution containing ferrous ions which reduce uranyl ions in the extractant to uranous ions in the strip solution, the concentration of H_3PO_4 in said strip solution being at least 8 molar;

(3) disengaging said strip solution from the organic extractant;

(4) contacting said strip solution with an oxidizing reagent which converts quadrivalent uranium to hexavalent form; and

(5) diluting the said phosphoric acid strip solution with water to a level at which the hexavalent uranium contained therein is efficiently extractable into said organic

extractant, and passing the thus-diluted hexavalent uranium-containing solution through a second liquid-liquid solvent extraction cycle in which the uranium is stripped from the organic phase with an aqueous solution of an ammonium carbonate to produce a product consisting essentially of ammonium uranyl tricarbonate.

4,500,494

MICROENCAPSULATED CHELATING AGENTS AND THEIR USE IN REMOVING METAL IONS FROM AQUEOUS SOLUTIONS

Herbert B. Scher, Moraga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 467,702, Feb. 18, 1983, abandoned, which is a continuation of Ser. No. 278,309, Jun. 29, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 560,771

Int. Cl.³ B01D *15/00;* **C01G** *5/00*

U.S. Cl. 423—24 **14 Claims**

1. A process for the purification of an aqueous solution containing metal ion impurities which comprises contacting said solution with a plurality of microcapsules, each comprising a liquid core material, which is substantially insoluble in water, consisting essentially of a metal ion chelating agent selected from the group consisting of -diketones, 8-hydroxyquinolines, and oximes, enclosed within a solid permeable shell of a material selected from the group consisting of polyurea and ureaformaldehyde resins, wherein said metal ion impurities pass through said shell of said microcapsules and are chelated by said chelating agents, and subsequently separating said microcapsules from said solution.

4,500,495

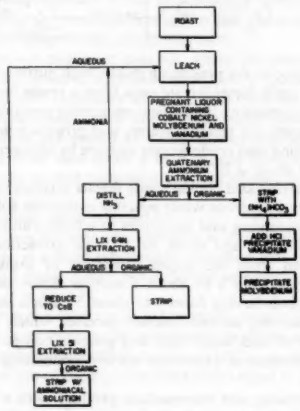
RECOVERING METALS FROM SPENT HYDROPROCESSING CATALYSTS

Gale L. Hubred, Richmond, and Dean A. Van Leirsburg, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 422,813, Sep. 24, 1982, Pat. No. 4,432,953, and a continuation-in-part of Ser. No. 422,814, Sep. 24, 1982, Pat. No. 4,434,140, and a continuation-in-part of Ser. No. 422,987, Sep. 24, 1982, Pat. No. 4,434,141. This application Aug. 1, 1983, Ser. No. 519,180

Int. Cl.³ C01G *31/00, 39/00, 41/00, 51/00*

U.S. Cl. 423—53 **8 Claims**



1. A process to recover the metal values from spent hydroprocessing catalyst particles, said values including:

(i) at least one metal value selected from the Group consisting of cobalt and nickel; and

(ii) at least one metal value selected from the Group consisting of vanadium, molybdenum and tungsten; comprising:

(a) roasting the particles in an atmosphere containing molecular oxygen at a temperature in the range of between 400° C. and 600° C.;

(b) leaching the particles with a first aqueous solution of ammonia and an ammonium salt at a temperature less than the atmospheric boiling point of said first aqueous solution, forming a first pregnant liquor and once-leached particles;

(c) separating the once-leached particles from the first pregnant solution;

(d) leaching the once-leached particles with a second aqueous solution containing sulfur dioxide, forming a second pregnant liquor and twice-leached particles;

(e) separating the second pregnant liquor from the twice-leached particles;

(f) precipitating metal sulfides from the second pregnant liquor by the addition of hydrogen sulfide; and

(g) roasting said precipitated metal sulfides with fresh spent catalyst in step (a);

(h) transferring said molybdenum, tungsten and vanadium metal values from said first pregnant liquor into a first organic solution by means of a first organic liquid extractant comprising a quaternary ammonium compound;

(i) stripping said first organic solution with a first aqueous ammonium bicarbonate stripping solution to form an aqueous solution containing said molybdenum, tungsten and vanadium metal values;

(j) transferring nickel values from said first pregnant liquor into a second organic solution by means of an organic nickel extractant comprising an oxime;

(k) reducing cobalt metal values in said pregnant liquor to divalent cobalt;

(l) transferring cobalt metal values from said pregnant liquor into a third organic solution by means of an organic cobalt extractant selected from the group consisting of dioximes, hydroxy-oximes, and beta-diketones;

(m) stripping each of said second and third organic solutions with aqueous stripping solutions to form a cobalt-containing aqueous solution and a nickel-containing aqueous solution.

4,500,496

PROCESS FOR PURIFYING MOLYBDENITE CONCENTRATES

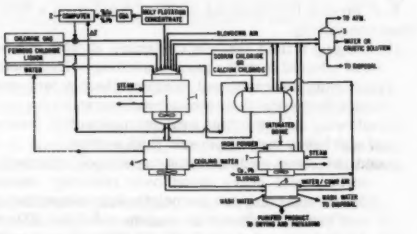
James W. Austin, Kelowna; Ronald G. Bradburn, Westbank; Clarence A. Cromwell, Peachland; Eitan Gratch, Toronto; Erich Groiss, Westbank; Derek Perkins, and Robert A. Walker, both of Kelowna, all of Canada, assignors to Brenda Mines Ltd., Peachland, Canada

Filed Sep. 30, 1982, Ser. No. 428,607

Claims priority, application Canada, Apr. 20, 1982, 401298

Int. Cl.³ C01G *39/00, 21/16*

U.S. Cl. 423—55 **14 Claims**



1. A process for purifying molybdenite concentrate for the removal of impurities therefrom, which comprises: providing a reactor with heating and agitator means, which reactor is made

of a material that can withstand leaching with the use of ferric chloride containing brine at elevated temperatures and pressures; introducing into said reactor ferrous chloride liquor and make-up water to give a predetermined iron concentration such that, upon chlorination, a sufficient amount of ferric ion will be formed to leach the impurities present in the molybdenite concentrate from their initial to desired final concentrations; sealing the reactor; insuring that the solution temperature in the reactor is between about 40° C. and 60° C.; injecting chlorine gas into the reactor while agitating the solution until the temperature rises to a point which, due to the exothermicity of the chlorination reaction, indicates through the temperature difference between the initial value and the final value, that the chlorination has produced the required amount of ferric ion in the solution to leach the impurities from their initial concentrations, determined from an assay of the molybdenite concentrate to be leached, to the desired final concentrations; upon completion of the chlorination resulting in the formation of a batch of brine suitable for leaching the molybdenite concentrate, venting the reactor to a scrubber and adding a predetermined amount of the molybdenite concentrate to be leached; thereafter sealing the reactor and heating its contents to a temperature suitable for leaching and continuing the leaching operation under agitation until the desired reduction in the impurities' concentrations has been achieved and the ferric ion essentially fully consumed; upon completion of the leaching operation, filtering and washing the resulting pulp to obtain the desired purified product.

4,500,497

REMOVAL OF TOXIC METALS FROM AQUEOUS SOLUTION

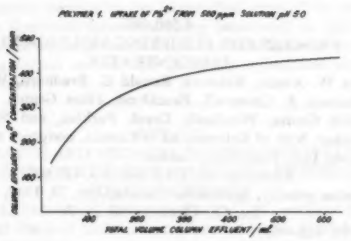
Alan G. Rowley, Loanhead, Scotland, and Fiona M. Husband, Rushey Mead, England, assignors to National Research Development Corporation, London, England

Filed Jun. 2, 1982, Ser. No. 384,256

Claims priority, application United Kingdom, Jun. 3, 1981, 8116974

Int. Cl.³ C01G *17/00*

U.S. Cl. 423—89 **16 Claims**


POLYMER I. UPTAKE OF Pb2+ FROM 500ppm SOLUTION pH 5.0
RESIDUAL EFFLUENT Pb2+ CONCENTRATION / ppm
TOTAL VOLUME COLUMN EFFLUENT / ml

1. A process for removing a heavy metal from a fluid medium comprising

(1) bringing a fluid medium containing at least one heavy metal selected from the group consisting of lead, mercury, zinc, iron, cadmium and mixtures thereof into contact with a heavy-metal-absorbing medium, and

(2) allowing said absorbing medium to absorb at least some of said heavy metal from said fluid medium,

said absorbing medium being capable of selectively absorbing said heavy metal over relatively innocuous metals and comprising a poly(maleic anhydride) polymer having IR absorption maxima at 3,480–3,500 cm^{-1}, 1,670–1,690 cm^{-1} and 1,190–1,210 cm^{-1}, said polymer having been rendered insoluble and non-swellable by polymerization in the presence of a Lewis base polymerization initiator bound to a support material which is insoluble in aqueous and organic media.

4,500,498

AMMONIUM CHLORIDE-AMMONIUM HYDROXIDE STRIP FOR THE RECOVERY OF ANHYDROUS ZINC CHLORIDE

Paul R. Kruesi, and William H. Kruesi, both of Golden, Colo., assignors to Cato Research, Inc., Wheat Ridge, Colo.

Filed Jan. 19, 1984, Ser. No. 571,935

Int. Cl.³ C01G *9/04*

U.S. Cl. 423—100 **8 Claims**

1. A process for recovering zinc chloride from a solution comprising zinc chloride solubilized in an organic solvent comprising:

(a) stripping zinc chloride from said solution comprising zinc chloride solubilized in an organic solvent with a stripping agent comprising an aqueous solution of at least about 75 g/l ammonium chloride and ammonium hydroxide;

(b) allowing a crystalline zinc chloride ammine compound to form in the stripping solution;

(c) separating the formed zinc chloride ammine compound from the stripping solution; and

(d) recovering zinc chloride from the zinc chloride ammine compound.

4,500,499

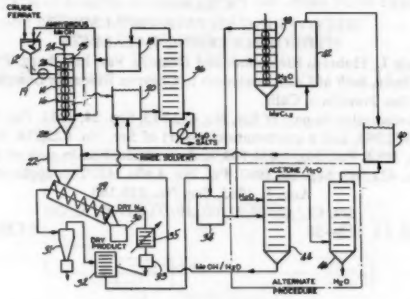
PRODUCTION OF HIGH PURITY STABLE FERRATE SALTS

Jerry J. Kaczur, and John E. Coleman, both of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 1, 1983, Ser. No. 500,126

Int. Cl.³ C01G *49/00*; C01D *13/00*

U.S. Cl. 423—139 **19 Claims**



1. A process for producing stable, high purity alkali metal or alkaline earth metal ferrate salts from a crude ferrate reaction mixture containing impurities comprising precipitated process components and residual water, said process comprising:

a. chilling said crude ferrate mixture to between about −20° and about +20° C.;

b. admixing said chilled crude ferrate mixture into a substantially anhydrous water miscible extraction solvent capable of dissolving said impurities at a temperature of between about −5° and about 20° C., said extraction solvent selected from the group consisting of primary alcohols having from 1 to about 4 carbon atoms and secondary alcohols having from 3 to about 5 carbon atoms;

c. separating an intermediate product which is essentially free of said water and said process components from a contaminated extraction solvent containing said impurities;

d. admixing said intermediate product with a substantially anhydrous, oxidation resistant rinse solvent which is miscible with said extraction solvent, said rinse solvents selected from the group consisting of ketones having from 3 to about 5 carbon atoms, tertiary alcohols having from 4 to about 6 carbon atoms, and halogenated aliphatic compounds having from 1 to about 7 carbon atoms;

e. washing said extraction solvent from said intermediate product with said rinse solvent to form a combined solvent;

f. separating said rinse solvent from said intemediate product to produce a purified dampened ferrate salt having a residue of combined extraction solvent and rinse solvent; and

g. drying said final dampened product in a warm dehumidified gas to vaporize said combined solvent, thereby producing a purified, stable, dry ferrate salt product.

4,500,500

SELECTIVE REMOVAL OF H_2S FROM STEAM ALSO CONTAINING CO_2

H. Hunter Paalman, Walnut Creek, and Denis Drapeau, San Francisco, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1983, Ser. No. 516,025

Int. Cl.³ B01D *53/31*

U.S. Cl. 423—224 **10 Claims**

1. An improvement in a known method of removing H_2S from a flow of steam which also contains up to 30 ppm of CO_2 per ppm of said H_2S,

said method comprising counter-currently contacting the steam flow with a sulfide-containing stream of an aqueous base, in which said base is an alkali metal hydroxide or carbonate and is present in a concentration equivalent to about 0.5 molar NaOH, in an absorption tower, thereby absorbing as much as about 50 percent of the H_2S in the aqueous base, discharging the aqueous stream from the tower as a sulfide-loaded effluent, treating the effluent with an oxidant, thereby converting a portion of the dissolved sulfide species to sulfite and/or sulfate species; discarding a part of the oxidized effluent as a bleed, adding makeup water and base to the remainder of the effluent and recycling the resultant mixture to the tower as said sulfide-containing stream of aqueous base;

said improvement making it possible, when the contacting means in said tower is equivalent to at least 6 equilibrium stages, to absorb essentially all of the H_2S from the steam without consuming more than about 0.18 pound of makeup water per pound of steam treated and without consuming more than about 4 mols of said hydroxide or about 2 mols of said carbonate per mol of said H_2S removed, and

said improvement being effected by:

(a) maintaining the base concentration in the liquid feed to the tower at a level substantially less than that equivalent to 0.5 molal NaOH but sufficient to maintain a pH therein of at least 12,

(b) operating the tower at liquid to steam weight ratio of about 0.18 or more, under autogenous pressure and at a temperature sufficiently in excess of 155° C. so that the acid strength of the H_2S is at least about equal to that of the CO_2, and

(c) employing said oxidant in an amount such that the proportion of the sulfide species in the effluent which are returned, unconverted, to the tower ranges from a maximum of about 7% when said liquid to steam weight ratio is 0.18 to a minimum of 0% when said weight ratio is about 0.6 or more.

4,500,501

METHOD OF REMOVING SULFUR OXIDES AND NITROGEN OXIDES BY DRY PROCESS

Takeshi Hamada, Ichikawa, and Yoshinobu Komatsubara, Kitakyushu, both of Japan, assignors to Mitsui Mining Company Ltd., Tokyo, Japan

Continuation of Ser. No. 412,974, Aug. 27, 1982, abandoned. This application Dec. 22, 1983, Ser. No. 564,462

Claims priority, application Japan, Sep. 10, 1981, 56-141701

Int. Cl.³ B01J *8/00;* **C01B** *21/00, 17/00*

U.S. Cl. 423—239 **14 Claims**

1. In a method of removing sulfur and nitrogen oxides by a dry process comprising passing a waste gas containing sulfur and nitrogen oxides through a moving bed or beds formed of a carbonaceous adsorbent in a direction transverse thereto to remove the sulfur oxides and adding ammonia to remove the nitrogen oxides, the improvement which comprises passing the waste gas containing sulfur and nitrogen oxides through n number of moving beds each formed of carbonaceous materials moving downward in a piston flow in such a manner that the waste gas is allowed to flow upward, said waste gas being directed through each of the moving beds in a transverse direction and in an opposite direction to the movement of the waste gas in the next adjacent moving bed, so that the waste gas alternately crosses and criss-crosses each moving bed successively from the lowest to the highest moving bed, said moving beds being arranged vertically and in series, wherein n is an integer of at least 2, said waste gas being passed through a first moving bed, mixed with ammonia outside the bed and then fed to a second moving bed, said process being repeated successively through the series of n moving beds until the waste gas exits from the n-th moving bed, while the carbonaceous material is transported from the n-th to the first moving bed.

4,500,502

PROCESS FOR REMOVING IMPURITIES FROM WET PROCESS OF PHOSPHORIC ACID

Daniel P. McDonald, and James C. Wade, both of Yazoo City, Miss., assignors to Mississippi Chemical Corporation, Yazoo City, Miss.

Filed Jun. 28, 1983, Ser. No. 508,469

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—321 R **26 Claims**

1. A method of preparing a purified ammoniated phosphoric acid composition, comprising:

reacting an aqueous wet process phosphoric acid having a P_2O_5 content of 23–62% with an ammonium ion source at a N/P_2O_5 weight ratio ranging from about 0.06 to about 0.15 in the presence of solid phase metal ion containing impurities for a time sufficient to precipitate the majority of the metal impurities in said acid, said impurity precipitation comprising at least several complex metal salts, one of which contains magnesium, aluminum and fluoride ions; and

obtaining said purified ammoniated phosphoric acid by separating said precipitated impurities therefrom.

4,500,503

PROCESS FOR THE PREPARATION OF MORDENITE UTILIZING TRANSITION METAL COMPLEXES DURING CRYSTALLIZATION

Lillian A. Rankel, Princeton, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 493,462, May 11, 1983, abandoned, which is a division of Ser. No. 320,285, Nov. 12, 1981, Pat. No. 4,388,285. This application Jul. 20, 1983, Ser. No. 515,718

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 **5 Claims**

1. In the process for the synthesis of mordenite from a form-

ing solution containing a mixture of alumina, silica, alkali metal oxide and water, the improvement which comprises adding a metal complex selected from the group consisting of cobalt phthalocyanine; (o-phenanthroline)$_3$FeClO$_4$; Ru(bipyridyl)$_3$Cl$_2$ and Ni(bipyridyl)$_3$ClO$_4$ to the reaction mixture and maintaining the same at a temperature of from 100° F. to about 400° F. until crystals of mordenite are formed with the proviso that when cobalt phthalocyanine is used the OH^-/SiO_2 ratio of the forming solution is 0.6.

4,500,504

PROCESS FOR PREPARING SILICON CARBIDE WHISKERS

Akira Yamamoto, Nagoya, Japan, assignor to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,796
Claims priority, application Japan, Feb. 25, 1982, 57-28146
Int. Cl.^{3} C01B *31/36*
U.S. Cl. 423—345 **10 Claims**

1. A process for preparing silicon carbide whiskers comprising mixing 100 parts by weight of a silica gel, containing 6.0 to 25.0% by weight with respect to a silicon of a water-soluble compound of at least one metal selected from the group consisting of iron, nickel and cobalt, with 110 to 400 parts by weight of a furnace carbon black having a structure indicated by a DBP absorption number of not lower than 50 ml/100 g, and reacting the resultant mixture by heating at a temperature ranging from 1,300° to 1,700° C. in a non-oxidizing atmosphere.

4,500,505

PROCESS FOR THE PRODUCTION OF HYDROGEN AND CARBONYL SULFIDE FROM HYDROGEN SULFIDE AND CARBON MONOXIDE USING A MULTI-METAL OXIDE/SULFIDE CATALYST

Mary G. Jevnikar, Cleveland, and Philip L. Kuch, Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 10, 1982, Ser. No. 448,578
Int. Cl.^{3} C01B *31/26, 1/03*
U.S. Cl. 423—416 **23 Claims**

1. A process for the production of hydrogen and carbonyl sulfide, the process comprising contacting gaseous hydrogen sulfide with gaseous carbon monoxide in the presence of a catalytic amount of a composition of the formula:

$$M_aO_xS_yM'_bM''_c \quad (I)$$

where

M is at least one of Mo, W, Fe, Cr and V;

M' is at least one of Li, Na, K, Rb, Cs, Cu, Co, and Al when b is greater than 0;

M'' is at least one of Sn, Mn, Pb, Ge, Si, Mg, Ca, Sr, Ba, Zn, Ti, Hf and Zr when c is greater than 0;

a is a number of about 0.1–2;

b is a number of 0 to about 3;

c is a number of 0 to about 10; and

the sum of x+y is a number that satisfies the valence requirements of the other elements present;

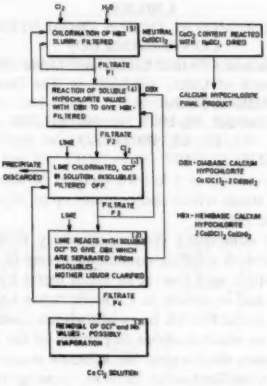
with the proviso that at least one of b and c is greater than zero.

4,500,506

PRODUCTION OF CALCIUM HYPOCHLORITE

David L. Morgan, Johannesburg, South Africa, assignor to Klipfontein Organic Products Corporation Limited, Transvaal, South Africa

Continuation of Ser. No. 459,728, Jan. 20, 1983, abandoned, which is a continuation of Ser. No. 356,537, Mar. 9, 1982, abandoned. This application Sep. 30, 1983, Ser. No. 538,066
Claims priority, application South Africa, Mar. 9, 1981, 81/1550
Int. Cl.^{3} C01B *11/06*
U.S. Cl. 423—474 **5 Claims**


CHLORINATION OF HBX SLURRY FILTERED
NEUTRAL
FILTRATE F1
REACTION OF SOLUBLE HYPOCHLORITE VALUES WITH DBX TO GIVE HBX - FILTERED
CALCIUM HYPOCHLORITE FINAL PRODUCT
FILTRATE F2
LIME
PRECIPITATE DISCARDED
LIME CHLORINATED, OCl⁻ IN SOLUTION, INSOLUBLES FILTERED OFF
DBX - DIBASIC CALCIUM HYPOCHLORITE
FILTRATE F3
HBX - HEMIBASIC CALCIUM HYPOCHLORITE
LIME REACTS WITH SOLUBLE OCl⁻ TO GIVE DBX WHICH ARE SEPARATED FROM INSOLUBLES. MOTHER LIQUOR CLARIFIED
FILTRATE F4
REMOVAL OF OCl⁻ and Ca⁺⁺ VALUES - POSSIBLY EVAPORATION

1. A method of making neutral calcium hypochlorite including the steps of:

(i) chlorinating a slurry of lime which contains impurities including iron, other heavy metals, manganese, silica and alumina to form a mother liquor and separating the insoluble impurities from the mother liquor to give a solution containing hypochlorite ions and free of insoluble impurities;

(ii) reacting lime which contains impurities including iron, other heavy metals, manganese, silica and alumina with the solution of step (i) in the presence of seed crystals to produce large crystals of dibasic calcium hypochlorite, together with mother liquor and insoluble impurities in a slurry; the crystals of dibasic hypochlorite being large and easily separable, thereby enabling said crystals to be separated from the fine insoluble impurities that are finer than the large crystals of dibasic calcium hypochlorite; and

(iii) without treating the slurry at any stage to precipitate out the iron impurities; separating the large crystals of dibasic calcium hypochlorite from the mother liquor and also separating the large dibasic calcium hypochlorite crystals from the fine insoluble impurities;

(iv) reacting the dibasic calcium hypochlorite with the solution of step (i) to produce hemibasic calcium hypochlorite crystals;

(v) separating the crystals of hemibasic calcium hypochlorite from the mother liquor; and

(vi) converting the hemibasic calcium hypochlorite crystals into neutral calcium hypochlorite.

4,500,507

DIAGNOSTIC COMPOSITION FOR RADIOLOGIC IMAGING OF NEOPLASMS IN THE BODY AND METHOD OF PREPARATION

Dennis W. Wong, 2853 Sunnyglen Rd., Torrance, Calif. 90505

Filed Oct. 30, 1981, Ser. No. 316,957
Int. Cl.³ A61K *29/00, 49/00*
U.S. Cl. 424—1.1 25 Claims

1. A method of labeling porphyrin compounds, related analogs, derivatives and substances containing porphyrin with the radionuclides of Technetium(Tc) at physiologic pH 7–8 condition which comprises the sequential steps of:

a. treating the radionuclide of technetium with a reducing agent at room temperature for 1–10 minutes;

b. raising the pH of the acidic mixture of step (a) to 7.4 with a sufficient amount of alkaline citrate complexing reagent;

c. binding of the radionuclide of technetium to the porphyrin ligand by adding 1–10 ml of an aqueous solution of the porphyrin compound desired to be labeled to the admixture of step (b) and incubating the admixture at room temperature for 30 minutes.

4,500,508

RADIONUCLIDE LABELED LYMPHOCYTES FOR THERAPEUTIC USE

Suresh C. Srivastava, Setauket; Rashid A. Fawwaz, Pelham, and Powell Richards, Bayport, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 3, 1983, Ser. No. 491,132
Int. Cl.³ A61K *49/00, 43/00*
U.S. Cl. 424—1.1 21 Claims

1. Lymphocytes labeled with a therapeutically effective amount of a β-emitting radionuclide selected from the group consisting of ^{109}Pd, ^{67}Cu, ^{66}Ni, ^{55}Co, ^{69}Zn and ^{90}Y.

4,500,509

METACHROMATIC DYE SORPTION AND FLUORESCENT LIGHT EMMISIVE MEANS FOR DIFFERENTIAL DETERMINATION OF DEVELOPMENTAL STAGES OF NEUTROPHILIC GRANULOCYTIC CELLS AND OTHER LEUKOCYTES

Lawrence Kass, 3229 Sheatham Ct., Toledo, Ohio 43615

Continuation-in-part of Ser. No. 242,662, Mar. 11, 1981, Pat. No. 4,400,370, which is a continuation-in-part of Ser. No. 129,680, Mar. 12, 1980,. This application Mar. 9, 1982, Ser. No. 356,578
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.³ G01N *31/00, 1/00*
U.S. Cl. 424—3 13 Claims

1. In analysis of human blood cells present in a donor specimen in a fixative-free aqueous environment under influence of a fluorescent light emissive energy source, the improvement in identification, enumeration and study of monocytes present in said specimen which comprises staining said specimen with an aqueous solution of a basic, cationic, quaternary organic dyestuff selected from the group consisting of basic orange #21, basic red #13, basic red #36, basic red #49, basic violet #7, basic violet #15, basic violet #16 basic violet #36, basic violet #39 basic violet #40 and carboeyanine; K-5 subjecting said dye stained specimen to emissive wave energy to thereby stimulate fluorescence of said dye exposed cells, emitted fluorescence light providing means for differentiation of monocytes present in the specimen from all other blood cells.

4,500,510

DAMAGED FISH TISSUE TREATING METHOD AND COMPOSITION CONTAINING *ALOE VERA* EXTRACT

Joel Goldstein, Ambler, Pa., assignor to Aquarium Pharmaceuticals, Inc., Perkasie, Pa.

Continuation-in-part of Ser. No. 426,351, Sep. 29, 1982, abandoned. This application Jun. 7, 1983, Ser. No. 501,990
Int. Cl.³ A61K *31/79, 35/78*
U.S. Cl. 424—80 11 Claims

1. A process for treating damaged tissue of fish comprising topically administering to the fish an aloe vera extract selected from the group consisting of the liquid extract or gel obtained directly from the inner central zones of the leaves of the Aloe Vera plant and the gel reconstituted from powdered aloe vera extract, in an amount effective to promote healing of the damaged tissue.

8. An aqueous composition for treating damaged tissue of fish in which at least a portion of a slime coating on the fish has been removed, comprising an aloe vera extract selected from the group consisting of the liquid extract or gel obtained directly from the inner central zones of the leaves of the aloe vera plant and the gel reconstituted from powdered aloe vera extract, in an amount effective to promote healing of the damaged tissue, at least one slime-replacing compound in an amount effective to promote slime replacement of at least a portion of the missing fish slime coating, a dechlorinator selected from the group consisting of sodium thiosulfate and ascorbic acid in an amount effective to neutralize the chlorine in the water, a tris(hydroxymethyl)aminomethane buffer in an amount effective to maintain the pH of the composition at least about 9.0, and a diazolidinyl urea preservative in an amount effective to prevent the inactivity of the aloe vera gel.

4,500,511

ANTIINFLAMMATORY AND ANALGESIC GEL

Kazuo Kigasawa; Hideaki Ohtani, both of Tokyo, and Toshiyuki Kanezuka, Kawasaki, all of Japan, assignors to Grelan Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,745
Claims priority, application Japan, Sep. 14, 1982, 57-158938
Int. Cl.³ A61U *31/19, 31/78*
U.S. Cl. 424—81 9 Claims

1. An antiinflammatory and analgesic gel composition for extermnal use which comprises 0.03 to 1.5 percent by weight of clidanac or a pharmacologically acceptable salt thereof as a pharmacologically active ingredient and 0.5 to 5.0 percent by weight of a gelling agent, which is at least one selected from the group consisting of a carboxyvinyl polymer, a cellulose derivative and an alginic acid propylene glycol ester, 0.3 to 4.0 percent by weight of a neutralizer, 30 to 60 percent by weight of a solubilizer and 35 to 65 percent by weight of water.

4,500,512

STABILIZING AGENTS FOR LIVE VIRUSES FOR PREPARING VACCINES, AND STABILIZED VACCINES CONTAINING SAID STABILIZING AGENTS

Michel Barme, Paris, France, assignor to Institut Pasteur, Paris, France

Filed May 5, 1982, Ser. No. 375,086
Claims priority, application France, May 13, 1981, 81 09490
Int. Cl.³ A61K *39/275*
U.S. Cl. 424—89 3 Claims

1. Stabilized vaccine containing attenuated live yellow fever virus

said attenuated live yellow fever virus being essentially constituted by a suspension of live attenuated yellow fever virus in a stabilizing agent constituted by a phosphate buffer solution (PBS) containing calcium and magnesium ions, about 4% lactose, about 2% sorbitol and abouth a 0.005M to 0.05M final concentration of at least one amino acid, said stabilized vaccine being lyophilised.

4,500,513

INFLUENZA VACCINE PRODUCTION IN LIQUID CELL CULTURE

Karen K. Brown, Kansas City, Mo., and Richard C. Stewart, Merriam, Kans., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 39,236, May 15, 1979, abandoned. This application Sep. 29, 1982, Ser. No. 428,495
Int. Cl.³ A61K *39/12*; C12N *7/00, 7/02, 7/04*
U.S. Cl. 424—89 15 Claims

1. A method of preparing an influenza virus vaccine which comprises the steps of:

(a) infecting a portion of the cells of a liquid cell culture substantially free of proteolytic enzyme with an influenza virus;

(b) incubating the infected culture in the presence of a proteolytic enzyme under conditions sufficient to assure further infection and replication of the virus in cells other than the originally infected cells and an EID_{50}/ml titer of at least about 10^7;

(c) harvesting the virus from the culture, and;

(d) preparing a vaccine from the harvested virus.

4,500,514

PROCESS FOR PREPARING A HEAT-STABLE AQUEOUS SOLUTION OF HUMAN URINE KALLIKREIN AND PRODUCT PREPARED

Koichiro Nakanishi, Ashiya, and Hajime Hiratani, Sennan, both of Japan, assignors to Japan Chemical Research Co., Ltd., Kobe, Japan

Filed Dec. 1, 1983, Ser. No. 557,107
Claims priority, application Japan, Dec. 2, 1982, 57-212532
Int. Cl.³ A61K *37/553*
U.S. Cl. 424—94 9 Claims

1. A process for preparing a heat-stable aqueous solution of human urine kallikrein, which comprises contacting an effective amount of a pharmaceutically acceptable citric acid salt with human urine kallikrein in the form of aqueous solution.

7. A heat-stable human urine kallikrein composition comprising an aqueous solution of human urine kallikrein and a stabilizing effective amount of a pharmaceutically acceptable salt of citric acid.

4,500,515

METHOD FOR TREATING ALCOHOL AND DRUG ADDICTS

Alfred F. Libby, P.O. Box 4179, San Clemente, Calif. 92672

Continuation of Ser. No. 253,712, Apr. 13, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 479,713
Int. Cl.³ A61U *31/365*; A61K *33/06*; A01N *43/78*
U.S. Cl. 424—154 13 Claims

1. In a method for detoxifying a patient from an alcohol or drug dependence, wherein the patient is caused to discontinue further ingestion of alcohol or the dependency-inducing drug, thereby to induce the patient to undergo withdrawal from alcohol or the dependency-inducing drug, until the patient is detoxified,

an improved method for detoxifying such a patient, wherein, upon causing the patient to discontinue further ingestion of alcohol or the dependency-inducing drug, the improved method comprises:

administering at least about 30 grams sodium ascorbate to the patient thereby to detoxify the patient, by:

orally giving a portion of the sodium ascorbate to the patient, and

intravenously infusing the remainder of the sodium ascorbate into the patient; and

intravenously infusing sufficient fluid into the patient with the infusing sodium ascorbate to prevent dehydration.

4,500,516

ANTIBACTERIAL PHARMACEUTICAL COMPOSITION

Grigory M. Grinberg, Moscow; Oleg N. Akifiev, Riga; Jury A. Pytel, Moscow; Anatoly P. Gilev, and Monika Y. Paberza, both of Riga, all of U.S.S.R., assignors to Institut Organicheskogo Sinteza Akademii Nauk Latviiskoi SSR, Riga, U.S.S.R.

Filed Oct. 22, 1982, Ser. No. 436,019
Int. Cl.³ A61K *33/10*
U.S. Cl. 424—156 6 Claims

1. An antibacterial composition comprising an antibacterially effective amount of an active agent consisting of the potassium salt of N-[β-(5'-nitrofuryl-2')-acrylidene]-1-amino hydantoin and an equivalent amount by weight of basic magnesium carbonate, in combination with a pharmaceutically acceptable filler.

4,500,517

ANTIMICROBIAL COMPOSITION FOR A SEMIPERMEABLE MEMBRANE

V. Gerold Luss, Minneapolis, Minn., assignor to H. B. Fuller Co., St. Paul, Minn.

Filed Dec. 7, 1981, Ser. No. 327,796
Int. Cl.³ A01N *59/02*
U.S. Cl. 424—162 19 Claims

1. An antimicrobial composition, which prevents the growth of or destroys microorganisms in and on semipermeable membranes, which comprises an aqueous solution of an effective antimicrobial amount of sulfurous acid or a sulfurous acid-yielding compound and an effective concentration of a buffer sufficient to maintain the pH of the aqueous solution less than about 4.5.

9. The antimicrobial composition of claim 1 wherein the aqueous solution also contains an effective wetting amount of a surfactant.

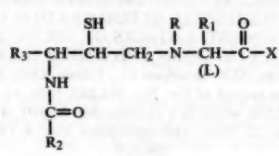
4,500,518

AMINO THIOL DIPEPTIDES

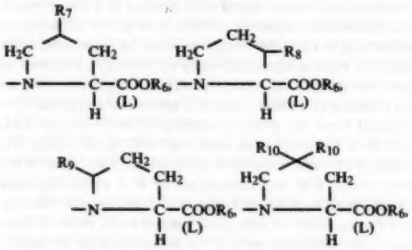
Eric M. Gordon, Pennington, and Jollie D. Godfrey, Jr., Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 19, 1984, Ser. No. 602,030
Int. Cl.³ H61K *37/00*; A01N *43/50, 43/36*; C07D *231/00, 211/60, 217/00*; C07C *103/52*
U.S. Cl. 514—2 18 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof wherein X is



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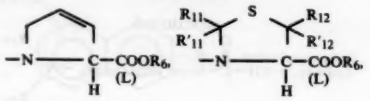
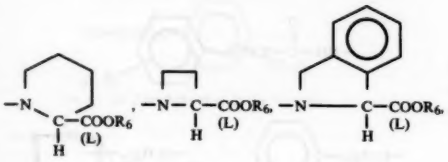
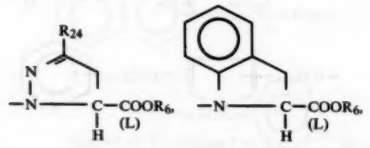
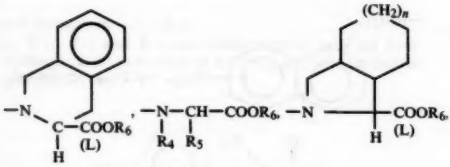
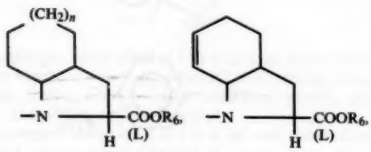
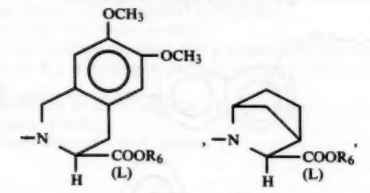


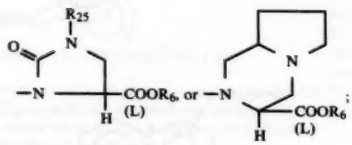






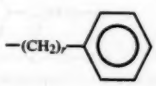




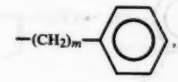


n is zero, one, or two.

R_{25} is lower alkyl of 1 to 4 carbons or

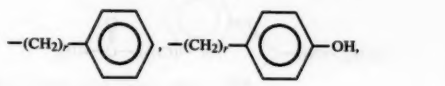


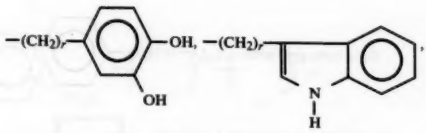
R is hydrogen, lower alkyl, cycloalkyl,

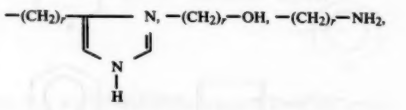


$-(CH_2)_2-NH_2$, $-(CH_2)_3-NH_2$, $-(CH_2)_4-NH_2$, $-(CH_2)_2-OH$, $-(CH_2)_3-OH$, $-(CH_2)_4-OH$, $-(CH_2)_2-SH$, $-(CH_2)_3-SH$, or $-(CH_2)_4-SH$;

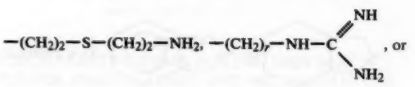
R_1 is hydrogen, lower alkyl, halo substituted lower alkyl,

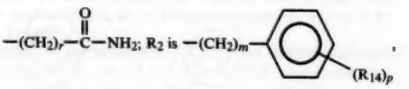


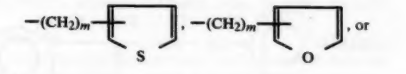


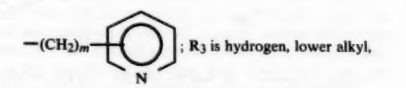


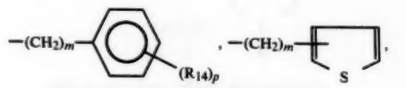
$-(CH_2)_r-SH$, $-(CH_2)_r-S-$lower alkyl,

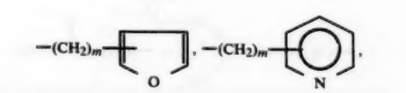












halo substituted lower alkyl, $-(CH_2)_m-$cycloalkyl,

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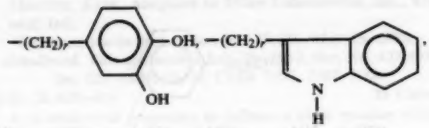
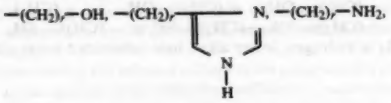
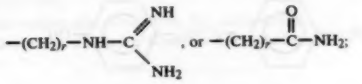


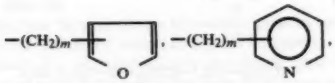


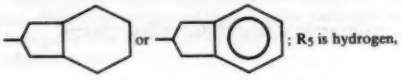
$-(CH_2)_r-SH$, $-(CH_2)_r-S-$lower alkyl,

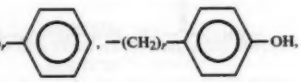


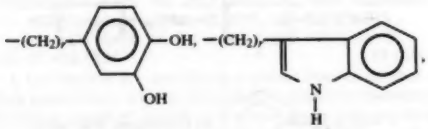
R_4 is hydrogen, lower alkyl, ,

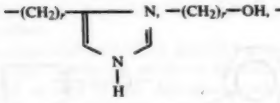
$-(CH_2)_m-$cycloalkyl, ,



 ; R_5 is hydrogen,

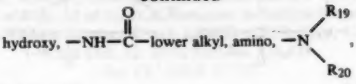
lower alkyl,  ,

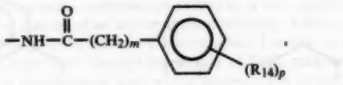


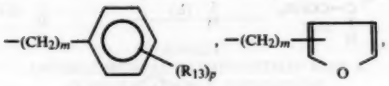


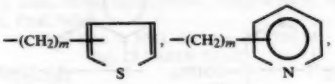
r is an integer from 1 to 4; R_7 is hydrogen, lower alkyl, halogen,

-continued

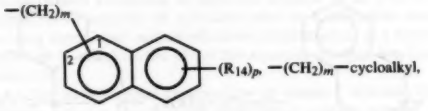
hydroxy, 

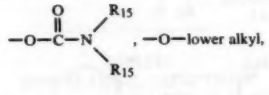


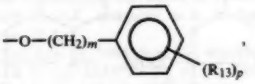




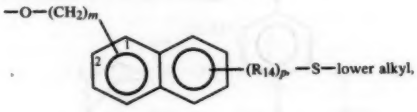
a 1- or 2-naphthyl of the formula

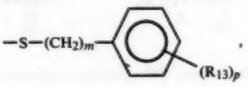


 , -O-lower alkyl,

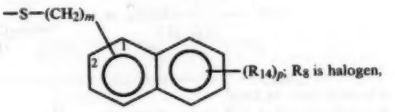


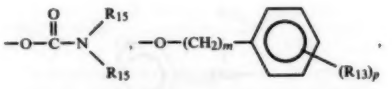
a 1- or 2-naphthyloxy of the formula





or a 1- or 2-naphthylthio of the formula





-O-lower alkyl, a 1- or 2-naphthyloxy of the formula

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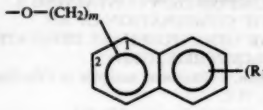
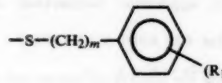
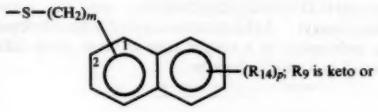


—S—lower alkyl,

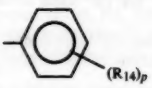


or a 1- or 2-naphthylthio of the formula



R_{10} is halogen or —Y—R_{16};

R_{11}, R'_{11}, R_{12} and R'_{12} are independently selected from hydrogen and lower alkyl or R'_{11}, R_{12} and R'_{12} are hydrogen and R_{11} is



R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

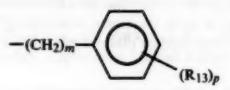
m is zero, one, two, three, or four;

p is one, two or three provided that p is more than one only if R_{13} or R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro;

R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;

Y is oxygen or sulfur;

R_{16} is lower alkyl of 1 to 4 carbons,

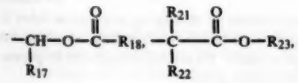


or the R_{16} groups join to complete an unsubstituted 5- or 6-membered ring or said ring in which one or more of the carbons has a lower alkyl of 1 to 4 carbons or a di(lower alkyl of 1 to 4 carbons) substituent;

R_{19} is lower alkyl, benzyl, or phenethyl;

R_{20} is hydrogen, lower alkyl, benzyl or phenethyl;

R_6 is hydrogen, lower alkyl, p-methoxybenzyl, benzhydryl,



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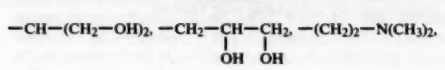
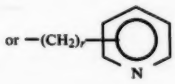
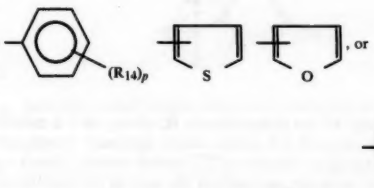




R_{17} is hydrogen, lower alkyl, cycloalkyl or phenyl;

R_{18} is hydrogen, lower alkyl, lower alkoxy, phenyl, or R_{17} and R_{18} taken together are —$(CH_2)_2$—, —$(CH_2)_3$—, —CH=CH, or

R_{24} is hydrogen, lower alkyl,



R_{21} and R_{22} are independently selected from the group consisting of hydrogen and lower alkyl; and

R_{23} is lower alkyl.

4,500,519

MUCOPOLYSACCHARIDES HAVING BIOLOGICAL PROPERTIES, PREPARATION AND METHOD OF USE

Jean-Claude Lormeau, Maromme; Maurice Petitou, and Jean Choay, both of Paris, all of France, assignors to Choay S.A., Paris, France

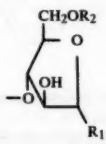
Continuation-in-part of Ser. No. 204,505, Nov. 6, 1980, , which is a continuation of Ser. No. 91,164, Nov. 5, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,567

Claims priority, application France, Mar. 20, 1980, 78 31357

Int. Cl.[3] **A61K** *31/725;* **C08B** *37/10*

U.S. Cl. 514—56 **42 Claims**

20. Mucopolysaccharide heparinic fractions which have the L-iduronosyl-2-O-sulfate-(1-alpha-4)-N-sulfo-D-glucosamine-6-O-sulfate disaccharide structural units of heparin with the O-sulfated iduronic component of heparin, which mucopolysaccharide heparinic fractions do not differ from heparin with respect to the unsulfated iduronic acid component and are further defined by having a terminal structure as follows



wherein R_1 is selected from the groups consisting of an alcohol and a carboxylic acid and R_2 is selected from the group consisting of hydrogen or —SO_3, which fractions have a molecular

weight in the range of about 2,000 to 8,000 daltons and the physiologically acceptable salts thereof.

4,500,520

ANTIINFLAMMATORY AND/OR ANALGESIC SILYLFURANS

Stephen B. Haber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

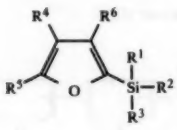
Filed Mar. 1, 1983, Ser. No. 471,201

The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.

Int. Cl.³ A61K *31/725*; C07F *7/18*

U.S. Cl. 514—63 **8 Claims**

1. A compound having the formula:

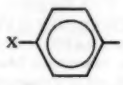


(I)

wherein

R^1, R^2 and R^3 are independently H, alkoxy of 1–2 carbon atoms, alkyl of 1–7 carbon atoms optionally substituted with halogen, alkenyl of 2–7 carbon atoms, phenyl or benzyl, with the proviso that the sum of the number of carbon atoms in R^1, R^2 and R^3 must be at least 1 and not greater than 9 with the additional proviso that no more than 2 of R^1, R^2 and R^3 are alkoxy;

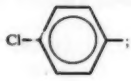
R^4 and R^5 are independently pyridyl or



where X is H, F, Cl, Br, R^7, OR^7, $S(O)_nR^7$, NO_2, or

where n=0, 1 or 2; R^7=alkyl of 1–2 carbon atoms and R^8=alkyl of 1–2 carbon atoms;

with the proviso that R^4 and R^5 cannot both be



and

R^6 is H, or alkyl of 1–2 carbon atoms; or a pharmaceutically suitable salt thereof.

8. A method of treating inflammation, pain or both in a mammal which comprises administering to the mammal an effective antiinflammatory or analgesic amount of at least one compound of claim **1**, claim **2**, claim **3**, claim **4**, claim **5**, or claim **6**.

4,500,521

PESTICIDAL COMPOSITION CONTAINING A SYNERGISTIC COMBINATION OF AN OXAZOLO-PYRIDINE THIOPHOSPHATE DERIVATIVE AND CYPERMETHRIN

Volker Dittrich, Zeiningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 2, 1983, Ser. No. 500,491

Claims priority, application Switzerland, Jun. 7, 1982, 3505/82

Int. Cl.³ A01N *37/34, 57/00*

U.S. Cl. 514—81 **4 Claims**

1. A composition for control of insects and acarids which comprises an insecticidally and acaricidally effective amount of a mixture of (i) S-[6-chloroxazolo[4,5-b]pyridin-2(3H)-on-3-ylmethyl]-O,O-dimethylthiophosphate and (ii) α-cyano-3-phenoxybenzyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate in a weight ratio of from about 2000:1 to about 6:1 in a carrier therefor.

4,500,522

7α-ACYLTHIO-15,16-METHYLENE-3-OXO-17α-PREGNA-1,4-DIENE-21,17-CARBOLACTONES, THEIR PREPARATION AND USE AS MEDICINAL AGENTS

Klaus Nickisch; Dieter Bittler; Henry Laurent; Rudolf Wiechert, and Wolfgang Losert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

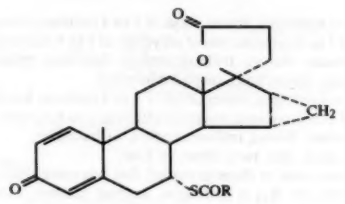
Filed Jul. 22, 1983, Ser. No. 516,391

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1982, 3227598

Int. Cl.³ A61K *31/58*

U.S. Cl. 514—173 **12 Claims**

1. A 7α-acylthio-15,16-methylene-3-oxo-17α-pregna-1,4-diene-21,17-carbolactone of the formula



wherein

the 15,16-methylene group can be in the α- or β-configuration, and

R is C_{1-5}-alkyl.

11. A method of achieving an antialdosterone effect in a patient in need of such treatment comprising administering an amount of a compound of claim **1** effective as an antialdosterone agent.

4,500,523

SUPPRESSION OF PREMATURE LABOR BY USE OF AROMATASE INHIBITORS

Nathanielsz, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

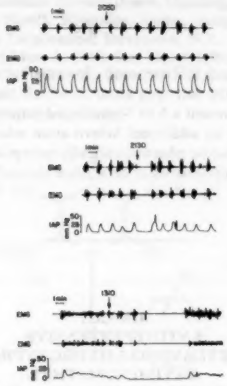
Continuation-in-part of Ser. No. 475,576, Mar. 15, 1983, abandoned. This application Apr. 9, 1984, Ser. No. 597,876

Int. Cl.³ A61K *31/56*

U.S. Cl. 514—178 **14 Claims**

1. A method of suppression or managing premature labor in a pregnant female mammal which is undergoing or which has undergone fetal surgery, and is therefore susceptible to premature labor which method comprises:

administering a Type I myometrial contraction reducing amount of a placental aromatase inhibitor to said female



mammal to thereby suppress or manage said premature labor.

4,500,524

TRANQUILIZING AND REDUCING OR PREVENTING SEIZURES

Nicholas Catsimpoolas, Newton Centre, Mass., assignor to Trustees of Boston University, Boston, Mass.

Continuation-in-part of Ser. No. 418,240, Sep. 15, 1982, abandoned. This application Aug. 11, 1983, Ser. No. 522,134

Int. Cl.³ A61K *31/33, 31/525*

U.S. Cl. 514—250 **6 Claims**

1. A method for inhibiting convulsions in an animal caused by abnormalities of the benzodiazepine receptors in the central nervous system of the animal or tranquillizing an animal which comprises introducing an inhibitor selected from the group consisting of riboflavin and folic acid into the central nervous system of said animal in an amount to inhibit convulsions or to tranquillize said animal.

6. A composition of matter comprising (a) riboflavin or folic acid and (b) a benzodiazepine in a weight ratio of between about 2:1 and 1000:1 wherein the total milligram dose is between about 10 and 1000 mg.

4,500,525

PHARMACOLOGICALLY ACTIVE PYRAZOLO/4,3-C/PYRIDINES

Giorgio Winters, Milan; Alberto Sala, Monza, and Domenico Barone, Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Italy

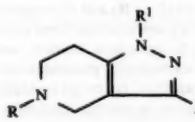
Filed Feb. 15, 1983, Ser. No. 466,701

Claims priority, application United Kingdom, Feb. 17, 1982, 8204722

Int. Cl.³ A61K *31/435*; C07D *471/04*

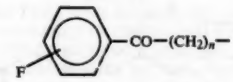
U.S. Cl. 514—210 **5 Claims**

1. A pyrazolo/4,3-c/pyridine having the formula

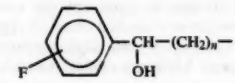


and a physiologically acceptable acid addition thereof, wherein R represents hydrogen, (C_1–C_{10})alkyl, (C_3–C_7)cycloalkyl, (C_1–C_6)alkanoyl, halogen(C_1–C_6)alkyl, (C_1–C_4)alkoxycarbonyl, hydroxy(C_1–C_6)alkyl, phenyl, phenyl substituted with from 1 to 3 substituents independently selected from chloro bromo, fluoro, cyano, nitro, hydroxy, thio, trifluoromethyl, (C_1–C_4)alkyl, (C_1–C_4)alkenyl, (C_2–C_4)alkynyl, (C_3–C_7)cycloalkyl, (C_1–C_4)alkoxy, (C_1–C_2)alkylthio, (C_1–C_4)alkoxycarbonyl, (C_1–C_4)alkylsulfinyl or a group of formula

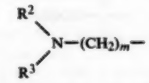
wherein R^6 and R^7 independently represent hydrogen, (C_1–C_6)alkyl, (C_1–C_6)hydroxyalkyl, (C_1–C_4)alkoxy, (C_2–C_4)alkyl, or R^6 and R^7 taken together with the adjacent nitrogen atom represent a (4–7) membered saturated heterocyclic ring which can optionally contain a further heteroatom selected from N, S, and O, and can bear a (C_1–C_4)alkyl group or a phenyl group optionally substituted as above, or R represents phenyl(C_1–C_6)alkyl, substituted phenyl(C_1–C_6)alkyl wherein the phenyl group is substituted as above, phenyl(C_1–C_6)alkanoyl, substituted phenyl(C_1–C_6)alkanoyl, wherein the phenyl group is substituted as above, a group of formula



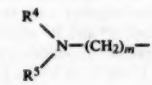
wherein n is an integer from 1 to 5 inclusive, or a group



wherein n is as above; or R is a group of formula:



wherein m is an integer from 2 to 4 inclusive, R^2 and R^3 independently represent hydrogen, (C_1–C_{10})alkyl, (C_1–C_6)hydroxyalkyl, (C_1–C_4)alkoxy, (C_2–C_4)alkyl, or R^2 and R^3 taken together with the adjacent nitrogen atom represent a (4–7) membered saturated heterocyclic ring which can optionally contain a further heteroatom selected from N, S, and O, and can bear a (C_1–C_4)alkyl group or a phenyl group optionally substituted as above R^1 represents hydrogen, (C_1–C_6)alkyl, (C_3–C_6)cycloalkyl, phenyl, substituted phenyl wherein the phenyl ring is substituted as above, phenyl(C_1–C_6)alkyl, substituted phenyl(C_1–C_6)alkyl, wherein the phenyl group is substituted as above, or R^1 represents a group of formula



wherein m is an integer from 2 to 4 inclusive, R^4 and R^5 are as defined above for R^2 and R^3, and Ar represents a phenyl group optionally substituted as above, or Ar is a 5–6 membered heteroaromatic ring selected from the group consisting of pyrrolyl, pyridyl, 4-aminopyridyl, 4-alkylaminopyridyl, thienyl, thiazolyl, oxazolyl, pyrazolyl and furanyl, which can bear a (C_1–$_6$)alkyl or phenyl substituent.

5. A CNS depressant, neuroleptic, cardiotonic, antihypertensive, analgesic or antiinflammatory composition in dosage unit form which comprises from 0.01 to 2.0 grams of a pyrazolo[4,3-c]pyridine according to claim 1 in combination with a pharmaceutically acceptable carrier.

4,500,526

CEPHALOSPORIN DERIVATIVES

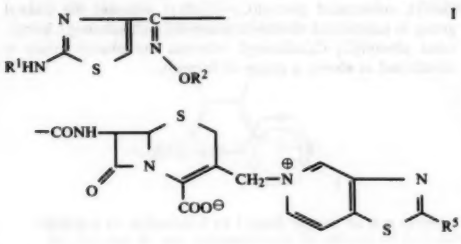
Kiyoto Imae, Ichikawa; Shimpei Aburaki, Tokyo; Yukio Narita; Jun Okumura, both of Yokohama, and Takayuki Naito, Kawasaki, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 392,866, Jun. 28, 1982, abandoned. This application Oct. 13, 1983, Ser. No. 541,593

Int. Cl.[3] **C07D** *501/36;* **A61K** *31/545*

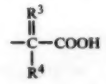
U.S. Cl. 514—226 **23 Claims**

1. A compound of the formula

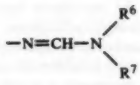


I

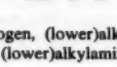
wherein R^1 is hydrogen or a conventional amino-protecting group, R^2 is a straight or branched chain alkyl group containing from 1 to 4 carbon atoms, allyl, propargyl, 2-butenyl, 2-butynyl, 3-butenyl, 3-butynyl, cyclo(lower)alkyl or a group of the formula



in which R^3 and R^4 each are independently hydrogen, methyl or ethyl, or R^3 and R^4, taken together with the carbon atom to which they are attached, may be a cycloalkylidene ring containing from 3 to 5 carbon atoms, and R^5 is hydrogen, carboxy, formyl, amino, carbamoyl, (lower)alkylamino, di(lower)alkylamino, guanidino, amidino, (lower)alkyl, (lower)alkoxy, (lower)alkylthio or a group of the formula



in which R^6 and R^7 each are independently hydrogen or (lower)alkyl, or when taken together with the nitrogen atom to which they are attached, R^6 and R^7 represent a 5 to 7-membered saturated ring optionally containing an additional hetero atom selected from N, O and S, or R^5 is a group of the formula



in which R^8 is hydrogen, (lower)alkyl, amino(lower)alkyl, (lower)alkoxy, amino, (lower)alkylamino or

in which R^9 and R^{10} are each (lower)alkyl or, when taken together with the nitrogen atom to which they are attached, R^9 and R^{10} represent a 5 to 7-membered saturated ring optionally containing an additional hetero atom selected from N, O and S; or a nontoxic pharmaceutically acceptable salt, physiologically hydrolyzable ester or solvate thereof.

4,500,527

ANTIHYPERTENSIVE 4[(3-ALKYLAMINO-2-HYDROXYPROPYL)-OXYIMINOMETHYL PHENYL]-1,4-DIHYDROPYRIDINES

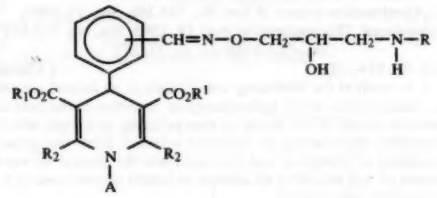
Bernard Loev, Scarsdale, N.Y.; James R. Shroff, Riverside, Conn., and Rohit Desai, Millwood, N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Jun. 22, 1983, Ser. No. 506,732

Int. Cl.[3] **A61K** *31/54, 31/455;* **C07D** *211/82, 417/00*

U.S. Cl. 514—223 **12 Claims**

1. A compound of the formula



wherein

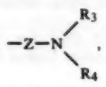
R is C_1–C_{10} alkyl,

each R_1 is independently H, C_1–C_4 alkyl, or C_1–C_4 alkoxy C_1–C_4 alkyl;

each R_2 is independently H, C_1–C_4 alkyl, formyl, CN, CH_2OH, or di C_1–C_4 alkylamino C_1–C_4 alkyl;

A is H, C_1–C_{10} alkyl, or X;

X is



Z is C_1–C_{15} alkylene;

R_3 and R_4 are independently H, C_1–C_4 alkyl, C_3–C_4 cycloalkyl, hydroxy C_1–C_4 alkyl, C_1–C_4 alkoxy C_1–C_4 alkyl, or phenyl C_1–C_4 alkyl, or R_3 and R_4 together with the nitrogen to which they are attached form pyrrolyl, imidazolyl, pyrazolyl, dihydropyrazinyl, indolyl, isoindolyl, purinyl, carbazolyl, β-carbolinyl, phenthiazinyl, phenoxazinyl, pyrrolinyl, pyrazolinyl, (o) or (p) isoxazinyl, imidazolinyl, or morpholino; or a pharmaceutically acceptable salt thereof.

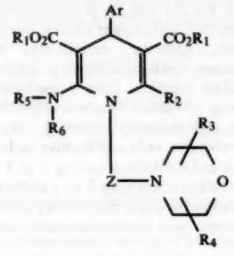
12. A method for treating hypertension in mammals requiring said treatment, wherein the method comprises the administration of an effective amount of a compound of claim 1.

4,500,528
N-SUBSTITUTED 1,4-DIHYDROPYRIDINES AND PHARMACEUTICAL COMPOSITIONS

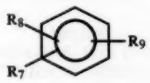
Bernard Loev, Scarsdale; Howard Jones, Ossining, both of N.Y., and James R. Shroff, Riverside, Conn., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,593
Int. Cl.³ A61K *31/535;* **C07D** *413/06*
U.S. Cl. 514—228 **23 Claims**

1. A compound of the formula:



wherein Ar is heteroaryl, cycloalkyl or



wherein each of R_7, R_8 and R_9 is H, alkyl, aryl, halo, lower alkoxy, nitro, amino, alkylmercapto, cyano, carboxy, carbalkoxy, sulfamyl, trifluoromethyl, hydroxy, acyloxy, methanesulfonyl, alkylamino or acylamino; and R_7 and R_8, when taken together, form a methylenedioxy; Z is alkylene containing 1 to about 5 carbon atoms in the principal chain; R_3 and R_4 are each H or alkyl; and each R_1, R_2, R_5 and R_6 is alkyl; and acid addition salts thereof.

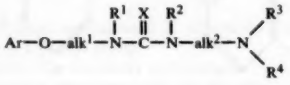
8. An anti-hypertensive composition comprising a compound according to claim 1 and pharmaceutically acceptable carrier.

4,500,529
METHOD OF TREATING CARDIAC DISORDERS WITH N-(ARYLOXYALKYL)-N'-(AMINOALKYL)UREAS

James R. Shanklin, Jr., and Christopher P. Johnson, III, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 265,510, May 20, 1981, abandoned. This application May 9, 1983, Ser. No. 492,534
Int. Cl.³ A61K *31/535, 31/17*
U.S. Cl. 514—235 **65 Claims**

1. A method for treating cardiac arrhythmia in an animal which comprises administering to said animal an effective amount of a compound having the formula:



wherein;

Ar is 1 and 2-naphthyl, 2,3-dihydro-1H-inden-4(or 5)yl, 3-pyridinyl, phenyl or phenyl substituted by 1–3 radicals which may be the same or different selected from the group consisting of loweralkyl, loweralkoxy, halogen, trifluoromethyl, amino, cyano, aminocarbonyl, nitro, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, loweralkanoyl, benzoylamino or loweralkanoylamino;

R^1 and R^2 are selected from the group consisting of hydrogen, loweralkyl, cycloalkyl containing 3 to 9 carbon atoms, phenyl, phenyl substituted by halogen, loweralkyl or loweralkoxy, or phenyl-loweralkyl wherein phenyl may also be substituted by halogen, loweralkyl or loweralkoxy;

X is selected from oxygen or sulfur;

R^3 and R^4 are selected from the group consisting of hydrogen, loweralkyl, phenyl and phenyl-loweralkyl and may be the same or different or R^3 and R^4 taken together with the adjacent nitrogen form a heterocyclic residue selected from the group consisting of pyrrolidino, piperidino, 4-phenylpiperidino, 2,6-loweralkyl-piperidino, 4-hydroxy-4-phenylpiperidino, 4-cyano-4-phenylpiperidino, 4-phenyl-1,2,3,6-tetrahydropyridino, piperazino, 4-loweralkyl-piperazino, 4-phenyl-piperazino, 4-phenylloweralkyl-piperazino or morpholino radicals;

alk^1 and alk^2 are selected from the group consisting of loweralkylene or loweralkylene-loweralkyl and may be the same or different, or a pharmaceutically acceptable addition salt or hydrate thereof.

4,500,530
METHOD OF TREATING HORSES TO INHIBIT OR REDUCE INCREASES IN CRENATED RED BLOOD CELLS DURING EXERCISE

John H. Boucher, 2106 Salisbury Rd., Silver Spring, Md. 20910

Division of Ser. No. 210,591, Nov. 26, 1980, Pat. No. 4,383,997. This application Sep. 23, 1982, Ser. No. 421,803
The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.
Int. Cl.³ A61K *31/495*
U.S. Cl. 514—255 **2 Claims**

1. A method of treating a horse to prevent or reduce the increase in crenated red blood cells which occurs in the blood of said animal after exercise sufficient to induce said increase of crenated red blood cells, the blood of said animal having a normal content of crenated red blood cells prior to said exercise, which comprises administering to said animal immediately prior, during or subsequent to said exercise an effective amount of a compound which inhibits influx of extracellular Ca^{++} ions into red blood cells.

2. A method according to claim 1 wherein the compound is lidoflazine.

4,500,531
THERAPEUTICAL USE OF (1-CINNAMOYL OR 1-PHENETHYLCARBONYL) PIPERAZINE DERIVATIVES

Alain Y. Platel, Rueil Malmaison; Alain P. Lacour, La Varenne, and Guy R. Bourgery, Colombes, all of France, assignors to Delalande S.A., Courbevoie, France

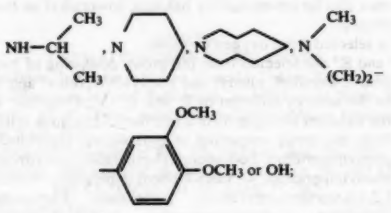
Filed Jul. 27, 1983, Ser. No. 461,701
Claims priority, application Italy, Feb. 4, 1982, 19457 A/82
Int. Cl.³ A61K *31/495*
U.S. Cl. 514—255 **6 Claims**

1. The method of stimulating or protecting cerebral function in a human being in order to increase mental alertness and capacity and to improve the focus on and performance of mental tasks, which comprises administering internally to a human being requiring such treatment a therapeutically effective amount of a compound of the formula

wherein Ar is selected from the group consisting of 3,4,5-

trimethoxyphenyl and 3,5-dimethoxy-4-hydroxyphenyl, and, when Ar is 3,4,5-trimethoxyphenyl, the pair X and A are selected from the group consisting of

(a) X is trans-CH=CH—CO— linked to Ar through its carbon atom 3, and A is

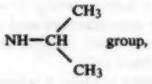


(b) X is cis-CH=CH—CO— linked to Ar through its carbon atom 3 and A is

and

(c) X is $-CH_2-CH_2-CO-$ linked to Ar through its carbon atom 3, and A is

and when Ar is 3,5-dimethoxy 4-hydroxy phenyl group, X is trans—CH=CH—CO— linked to Ar through its carbon atom 3 and A is the



or a pharmacological acceptable acid addition salt of said compound.

4,500,532

1-(SUBSTITUTED AMINOALKYL)-1,4-DIHYDROPYRIDINES

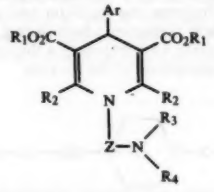
Bernard Loev, Scarsdale; Howard Jones, Ossining, both of N.Y., and John T. Suh, Greenwich, Conn., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,592

Int. Cl.[3] **A61K** *31/505, 31/455;* **C07D** *211/82, 401/04*

U.S. Cl. 514—256 **4 Claims**

1. A member selected from compounds of the formula



wherein Ar is heteroaryl selected from the group consisting of thiophene, furan, pyridine, thiazole, pyrimidine, pyrrole, benzofuran, quinoline and benzothiophene, cycloalkyl having from 3 to 7 carbon atoms, naphthyl, indanyl, indenyl, tetrahydronaphthyl, or a radical of the formula

wherein each of R_5, R_6 and R_7 is independently H, alkyl, phenyl, tolyl, naphthyl, halo, lower alkoxy, nitro, amino, alkylmercapto, cyano, carboxy, carbalkoxy, sulfamyl, trifluromethyl, hydroxy, methanesulfonyl, or alkylamino; and R_5 and R_6 when taken together, form a methylenedioxy; Z is alkylene containing 1 to about 5 carbon atoms in the principal chain; each R_1 is independently hydrogen, alkyl or alkoxyalkyl, with the proviso that only one R_1 may be hydrogen; R_2 is lower alkyl; R_3 is aminoalkyl containing 2 to 4 carbon atoms and R_4 is hydroxyalkyl containing 2 to 4 carbon atoms in the alkyl moiety; wherein the alkyl, and alkoxy groups contain up to 10 carbon atoms, and pharmaceutically-acceptable salts thereof.

4. An anti-hypertensive composition comprising, as an active ingredient, an effective anti-hypertensive amount of a compound according to claim 1 in a pharmaceutically acceptable carrier.

4,500,533

2,4,5-TRIARYL PYRIMIDINES AND A METHOD OF TREATING PAIN, FEVER, THROMBOSIS, INFLAMMATION AND ARTHRITIS

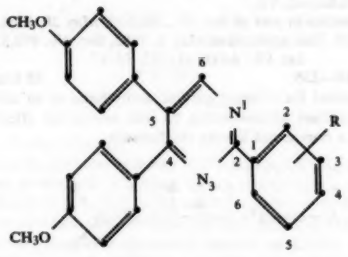
Ken Matsumoto, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 22, 1983, Ser. No. 506,932

Int. Cl.[3] **A61K** *31/505;* **C07D** *239/02*

U.S. Cl. 514—256 **14 Claims**

1. A compound of the formula



I

and pharmaceutically acceptable salts thereof, wherein R is hydrogen, trifluoromethyl, fluoro, chloro, bromo, or iodo.

5. A method of treating pain, fever, thrombosis, inflammation, or arthritis which comprises administering to a mammal in need of such treatment an effective amount of a compound of claim 1.

4,500,534

THIENO-PYRIDINONE DERIVATIVES, PROCESS FOR ITS PREPARATION, AND ANTI-BLOOD-PLATELET AND ANTI-THROMBOTIC APPLICATIONS THEREOF

Daniel Frehel, Toulouse; Jean-Pierre Maffrand, Portet, and Eric Vallee, Tournefeuille, all of France, assignors to Sanofi, S.A., Toulouse, France

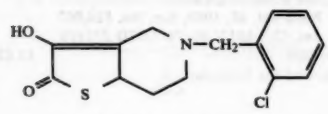
Filed Jun. 15, 1983, Ser. No. 504,524

Claims priority, application France, Jun. 16, 1982, 82 10926

Int. Cl.³ A61K *31/435;* **C07D** *495/04*

U.S. Cl. 514—301 **8 Claims**

1. 5,6,7,7*a*-Tetrahydro-4H-thieno(3,2-c)pyridin-2-one derivative, having the following structural formula (I):



(I)

and its pharmaceutically acceptable inorganic or organic acid addition salts.

6. Therapeutic composition having in particular anti-blood-platelet aggregation and anti-thrombosis activities, said composition comprising, an effective amount of the derivative as claimed in claim 1 and a suitable pharmaceutical carrier.

4,500,535

METHOD OF REGULATING THE IMMUNE RESPONSE WITH PYRIDINE DERIVATIVES

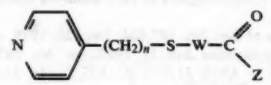
Joseph G. Lombardino, Niantic, and Charles A. Harbert, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 428,588, Sep. 30, 1982, abandoned, which is a division of Ser. No. 276,242, Jun. 26, 1981, Pat. No. 4,371,696, which is a continuation of Ser. No. 168,127, Jul. 14, 1980, abandoned, which is a division of Ser. No. 85,011, Oct. 15, 1979, Pat. No. 4,246,263. This application Mar. 7, 1983, Ser. No. 470,813

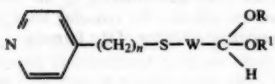
Int. Cl.³ A61K *31/44;* **C07D** *213/48, 213/51*

U.S. Cl. 514—277 **15 Claims**

1. A method for regulation of the immune response in a mammal which comprises administering to said mammal in an immune response regulating amount of a compound of the formula:



or



wherein

n is 1 or 2;

W is methylene, unsubstituted or substituted with either a methyl or a phenyl group;

Z is hydroxy, (C_1–C_4)alkoxy or hydrogen;

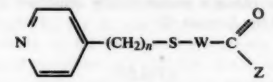
R and R^1 when taken separately are the same and are each (C_1–C_4)alkyl; and

R and R^1 when taken together are ethano or propano;

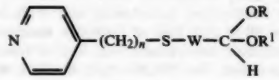
a pharmaceutically-acceptable acid addition salt thereof; or

a pharmaceutically-acceptable cationic salt thereof when Z is hydroxy.

10. A composition of matter suitable for regulating the immune response in a mammal comprising, in the form of a capsule or tablet, a compound of the formula



or



wherein

n is 1 or 2;

W is methylene, unsubstituted or substituted with either a methyl or a phenyl group;

Z is hydrogen;

R and R^1 when taken separately are the same and are each (C_1–C_4)alkyl;

and R and R^1 when taken together are ethano or propano;

a pharmaceutically-acceptable acid addition salt thereof; or

a pharmaceutically-acceptable cationic salt thereof when Z is hydroxy and a solid pharmaceutically acceptable carrier, said compound being present in an amount sufficient to supply a dosage in the range of about 0.25 to about 100 mg./kg. of body weight of said mammal per day in single or divided dosage.

4,500,536

DERIVATIVES OF N,N'-SUBSTITUTED AZOLECARBOXAMIDE AND AGRICULTURAL AND HORTICULTURAL FUNGICIDAL OR NEMATICIDAL COMPOSITION CONTAINING SAME AS ACTIVE INGREDIENTS

Hiroshi Yoshida, Urawa; Kengo Koike, Ageo; Shizuo Shimano, Ageo; Taizo Nakagawa, Ageo, and Kaoru Ohmori, Okegawa, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

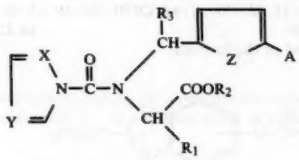
Filed Mar. 3, 1983, Ser. No. 471,963

Claims priority, application Japan, Mar. 4, 1982, 57-33040; Jul. 30, 1982, 57-132023; Jan. 20, 1983, 58-6691

Int. Cl.³ A01N *43/50, 43/56, 43/64;* **C07D** *231/10, 233/54, 249/08*

U.S. Cl. 514—397 **12 Claims**

1. A derivative of N,N-substituted azolecarboxamide represented by the formula:



(I)

wherein R_1 represents a hydrogen atom, methyl group or ethyl group or propyl group; R_2 represents an alkyl group of 1 to 6 carbon atoms; R_3 represents a hydrogen atom or methyl group; A represents a hydrogen atom or methyl group; X and Y represent respectively a carbon atom or nitrogen atom, provided that when X represents a nitrogen atom, Y represents a nitrogen atom or a carbon atom and when X represents a carbon atom, Y represents a nitrogen atom; and Z represents an oxygen atom or sulfur atom, provided that when Z represents a sulfur atom, A represents only a hydrogen atom.

11. A method for preventing diseases of agricultural or horticultural plants caused by fungi, comprising applying to

soil or said plants a fungicidally effective amounts of a compound of the formula (I).

12. A method for combatting nematodes, comprising applying to soil or plants a nematocidally effective amount of a compound of the formula (I).

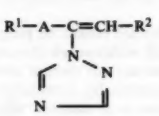
4,500,537

COMBATING FUNGI WITH TRIAZOLYL-VINYL KETONES AND CARBINOLS

Hans-Ludwig Elbe, Wuppertal; Karl H. Büchel, Burscheid; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 259,303, Apr. 30, 1981, abandoned.
This application May 13, 1983, Ser. No. 494,216
Claims priority, application Fed. Rep. of Germany, May 19, 1980, 3019046
Int. Cl.³ A01N *43/64, 55/02;* **C07D** *249/08;* **C07F** *1/08*
U.S. Cl. 514—383 **9 Claims**

1. A triazolyl-vinyl ketone or carbinol of the formula



in which

A represents the keto group or a CH(OH) grouping,

R^1 is tert.-butyl, chloro-tert.-butyl, fluoro-tert.-butyl, dichloro-tert.-butyl or difluoro-tert.-butyl, and

R^2 is n-butyl or n-heptyl, is benzyl, optionally substituted on the phenyl with halogen, alkyl with 1 to 4 carbon atoms, alkoxy or alkylthio with 1 to 4 carbon atoms or halogenoalkoxy or halogenoalkylthio with 1 to 4 carbon atoms and 1 to 5 halogen atoms, or is phenylethynyl,

or an addition product thereof with a physiologically acceptable acid or a metal salt.

7. A fungicidal composition comprising a fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

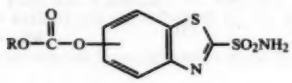
4,500,538

BENZOTHIAZOLESULFONAMIDE DERIVATIVES FOR THE TOPICAL TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

Otto W. Woltersdorf, Chalfont, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 14, 1983, Ser. No. 474,860
Int. Cl.³ A61K *31/675, 31/44;* **C07D** *263/58, 85/48*
U.S. Cl. 514—367 **16 Claims**

1. A compound of the formula:



where R is C_1 to C_{18} alkyl; C_3 to C_6 cycloalkyl; C_3 to C_6 cycloalkyl-C_1 to C_{18} alkyl; C_1 to C_{18} alkyl-C_3 to C_6 cycloalkyl; C_1 to C_{18} haloalkyl; aryl where the aryl group can be substituted with one or more substituents selected from the group consisting of C_1 to C_{10} alkyl, halo, and C_1 to C_4 alkoxy; arylalkyl where the alkyl moiety has from 1 to 4 carbon atoms and the aryl moiety can be unsubstituted or substituted with halogen or C_1 to C_3 alkyl; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl and aryl C_2 to C_6 alkenyl.

5. A method for treating glaucoma and ocular hypertension and for lowering intraocular pressure which comprises topically applying to an affected eye an effective intraocular pressure lowering amount of the compound of claim 1.

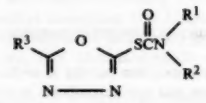
4,500,539

INSECTICIDAL 5-THIOCARBAMOYL-1,3,4-OXADIAZOLES

Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 15, 1983, Ser. No. 514,067
Int. Cl.³ A01N *43/76;* **C07D** *271/10*
U.S. Cl. 514—364 **12 Claims**

1. A compound the formula:



wherein R^1 and R^2 are independently lower alkyl having from 1 to 4 carbon atoms; and R^3 is lower cycloalkyl having from 3 to 6 carbon atoms optionally substituted with methyl or ethyl, lower alkoxyalkyl having up to a total of 8 carbon atoms or lower alkylthioalkyl having up to a total of 8 carbon atoms.

5. A method for killing insects which comprises contacting said insects or their habitat with an insecticidally effective amount of the compound of the formula defined in claim 1.

4,500,540

THROMBOXANE SYNTHASE INHIBITORS AS INSULIN LOWERING AGENTS AND ANTIOBESITY AGENTS

James G. Hamilton, Nutley; Ann C. Sullivan, Cedar Grove; Lawrence D. Tobias, Glen Ridge, and Joseph Triscari, Bloomfield, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 107,484, Dec. 26, 1979, abandoned.
This application Jun. 11, 1982, Ser. No. 387,721
Int. Cl.³ A61K *31/415, 31/305, 31/44, 31/40*
U.S. Cl. 514—397 **33 Claims**

1. A method for reducing body weight in obese mammals which comprises orally administering, to the mammal to be treated, an amount effective for reducing body weight of a thromboxane synthase inhibitor of the formula:

FORMULA I

wherein R is H, NO_2, or $-C_2$–C_4 alkenyl; R^1 is H, C_1–C_{11} alkyl, acetyl, propionyl, butyryl, phenyl, phenyl substituted by one or two substituents independently selected from the group consisting of C_1–C_3 alkoxy, C_1–C_4 alkyl, Cl, F, Br, NO_2, acetyl, propionyl, butyryl or hydroxy, phenylalkyl, or 3-indolo optionally substituted at the two position by C_1–C_4 straight or branched chain alkyl.

4,500,541
PHARMACOLOGICALLY ACTIVE CYCLOPROPANE DERIVATIVES

Hans-Heinrich Hausberg, Ober-Ramstadt; Jürgen Uhl; Christoph Seyfried, both of Seeheim-Jugenheim, and Klaus-Otto Minck, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

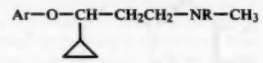
Continuation-in-part of Ser. No. 261,820, May 8, 1981, abandoned. This application Jun. 17, 1983, Ser. No. 505,558

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017812

Int. Cl.[3] **A61K** *31/36, 31/135;* **A01N** *9/20;* **C07C** *93/06*

U.S. Cl. 514—466 **11 Claims**

1. A cyclopropane derivative of the formula



wherein Ar is phenyl or phenyl monosubstituted or polysubstituted by F, Cl, Br, C_{1-4} alkyl, C_{1-4} alkoxy, C_{2-4} alkenyloxy, C_{1-4} alkylthio, OH, SH, CN, methylenedioxy or CF_3; and R is H, C_{1-4} alkyl or benzyl, or a physiologically acceptable acid addition salt thereof.

8. 1 Dimethylamino-3-cyclopropyl-3-p-trifluoromethylphenoxy-propane, a compound of claim **1**, and its hydrochloride.

9. A pharmaceutical composition for treating depression, comprising an antidepressantly effective amount of a compound of claim **1** and a pharmaceutically acceptable adjuvant.

11. A method of treating depression in a patient in need of such treatment comprising administering an antidepressantly effective amount of a compound of claim **1** to the patient.

4,500,542
DIOXAHETEROCYCLIC COMPOUNDS

Ernst Habicht, Oberwil, and Paul Zbinden, Witterswil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

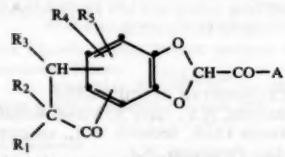
Continuation of Ser. No. 369,787, Apr. 19, 1982, abandoned. This application Nov. 8, 1983, Ser. No. 550,060

Claims priority, application Switzerland, Apr. 24, 1981, 2697/81

Int. Cl.[3] **A61K** *31/36, 31/44;* **C07D** *401/00, 317/70*

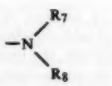
U.S. Cl. 514—465 **22 Claims**

1. A dioxaheterocyclic compound of the formula I



(I)

in which R_1 represents phenyl or pyridyl each of which is unsubstituted or substituted by lower alkyl, lower alkoxy or halogen, R_2 represents primary lower alkyl, each of R_3 and R_4 represents, independently of the other, hydrogen or lower alkyl, R_5 represents hydrogen and A represents the radical —O—R_6 in which R_6 represents hydrogen or an unsubstituted or substituted aliphatic or araliphatic hydrocarbon radical or the radical



in which each of R_7 and R_8, independently of the other, represents hydrogen or lower alkyl, or, R_7 and R_8 are bonded to one another and, together with the adjacent nitrogen atom, represent unsubstituted or lower alkyl-substituted tetra- to hexamethylene-imino or 4-morpholinyl, and the divalent radical in formula I is either in the 4,5- or the 5,6-position and correspondingly R_4 and R_5 are in positions 6 and 7, or 4 and 7, respectively, of the benzodioxole skeleton, in the form of a mixture of racemates, of racemates, diastereoisomeric antipode mixture or optical antipodes, and the pharmaceutically acceptable salts of such a compound in which A represents OR_6 wherein R_6 represents hydrogen, with bases.

14. A pharmaceutical composition having diuretic activity comprising a diuretically effective amount of a compound according to claim **1** or of a pharmaceutically acceptable salt of a compound according to claim **1** capable of salt formation, together with at least one pharmaceutical carrier.

19. A method for treating oedema or hypertension in a mammal comprising administering to said mammal an amount effective against oedema or hypertension of a compound according to claim **1** or of a pharmaceutically acceptable salt of a compound according to claim **1** that is capable of salt formation.

4,500,543
SUBSTITUTED 1-AMINOMETHYL-PHTHALANS

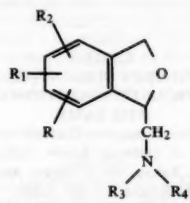
John F. Debernardis, Lake Villa, and David L. Arendsen, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 1, 1982, Ser. No. 383,632

Int. Cl.[3] **A61K** *31/34;* **C07D** *307/78*

U.S. Cl. 514—469 **7 Claims**

1. A compound of the formula

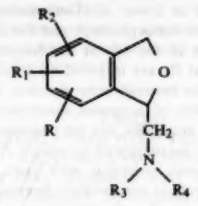


wherein R, R_1, and R_2 are independently selected from hydrogen, hydroxy, thiomethyl, or

wherein R_5 and R_6 are independently selected from hydrogen, loweracyl of 1 to 4 carbon atoms or sulfonyl of the formula

wherein R_7 is loweralkyl of 1 to 4 carbon atoms; and wherein no more than one of R, R_1 or R_2 is hydrogen; and R_3 and R_4 are independently selected from hydrogen; loweralkyl of 1 to 4 carbon atoms; or halo-substituted loweralkyl of 1 to 4 carbon atoms; and the pharmaceutically acceptable salts thereof.

7. A composition in pharmaceutical dosage form for the treatment of hypertension comprising an anti-hypertensive effective amount of a compound of the formula



wherein R, R_1, and R_2 are independently selected from hydrogen, hydroxy, thiomethyl, or

wherein R_5 and R_6 are independently selected from hydrogen, loweracyl of 1 to 4 carbon atoms or sulfonyl of the formula

wherein R_7 is loweralkyl of 1 to 4 carbon atoms; and wherein no more than one of R, R_1, or R_2 is hydrogen; and R_3 and R_4 are independently selected from hydrogen; loweralkyl of 1 to 4 carbon atoms; or halo-substituted loweralkyl of 1 to 4 carbon atoms; and the pharmaceutically acceptable salts thereof and a pharmaceutically acceptable carrier or diluent.

4,500,544

ASCOCHLORIN DERIVATIVES, AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Tomoyoshi Hosokawa, Kanagawa; Ikutoshi Matsuura; Hidenori Takahashi, both of Saitama; Kunio Ando, Kanagawa, and Gakuzo Tamura, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Ukima, Japan

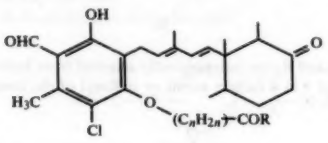
Filed Aug. 27, 1982, Ser. No. 412,075

Claims priority, application Japan, Sep. 10, 1981, 56-141660; Oct. 23, 1981, 56-168821

Int. Cl.[3] **C07C** *59/92, 69/738;* **A61K** *31/19, 31/215*

U.S. Cl. 514—543 **24 Claims**

1. An ascochlorin derivative of the formula:



(I)

(wherein R is a hydroxyl group; an alkoxy group having carbon atoms of from 1 to 6; a phenoxyalkyl group which may have a halogen atom, an alkyl group having carbon atoms of from 1 to 4, or an alkoxy group having carbon atoms of from 1 to 4 in the nucleus; or a phenyl group which may have a halogen atom, an alkyl group having carbon atoms of from 1 to 4, an alkoxy group having carbon atoms of from 1 to 4 or an alkoxycarbonyl group having carbon atoms of from 2 to 5 in the nucleus; and n is an integer of 0 to 5).

2. An ascochlorin derivative according to claim 1 which is 4-O-ethoxycarbonylmethyl ascochlorin.

4,500,545

HYDROXYAMINOTETRALINCARBOXAMIDES

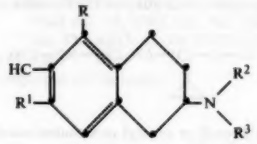
Nicholas J. Bach; Edmund C. Kornfeld, and Robert D. Titus, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 442,074, Nov. 16, 1982, Pat. No. 4,448,990. This application Mar. 12, 1984, Ser. No. 588,180

Int. Cl.[3] **A61K** *31/165*

U.S. Cl. 514—619 **12 Claims**

1. A method for reducing elevated blood pressure in a mammal having high blood pressure and in need of treatment which comprises administering to said mammal a hypotensive dose of a drug of the formula



wherein one of R and R^1 is H and the other is $CONH_2$, R^2 and R^3 are individually H, methyl, ethyl or n-propyl, and a pharmaceutically-acceptable acid addition salt thereof formed with a non-toxic acid.

4,500,546

SUSPENSIONS CONTAINING MICROFIBRILLATED CELLULOSE

Albin F. Turbak, Convent Station; Fred W. Snyder, Wharton, both of N.J., and Karen R. Sandberg, Shelton, Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 202,740, Oct. 31, 1980, Pat. No. 4,378,381. This application Nov. 15, 1982, Ser. No. 441,686

Int. Cl.[3] **A61K** *47/00*

U.S. Cl. 514—781 **4 Claims**

1. A cosmetic base comprising a suspension of a finely divided cosmetic material in a liquid suspending medium which swells cellulose, said suspension containing microfibrillated cellulose in an amount ranging from 0.25% to an amount such that it is present as the major ingredient of the suspension, said proportions being based on the weight of cellulose solids present as microfibrillated cellulose as compared to the total weight of the suspension, said amount being sufficient to produce a stable, homogeneous suspension, said microfibrillated cellulose having a settling volume after 60 minutes in a 0.5% by weight suspension in water of greater than 60%.

4,500,547

REDUCED-SHRINK BUBBLE GUM

Wayne J. Puglia, Bayville, N.Y.; Gary S. Kehoe, Ridgefield, Conn., and K. Warren Clark, Brewster, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 413,053, Aug. 30, 1982, abandoned. This application Mar. 15, 1984, Ser. No. 589,968

Int. Cl.[3] **A23G** *3/30*

U.S. Cl. 426—3 **20 Claims**

1. In a non-styrene-butadiene based chewing gum composition having high film-forming characteristics,

a high inorganic filler content in an amount of from about 12% to about 44% based on the weight of said overall chewing gum composition,

a non-styrene-butadiene gum base in an amount of from about 15% to about 30% by weight of said chewing gum composition, and water-soluble sweeteners, the improvement comprising adding said filler in an amount from about 20% to about 35% by weight of said gum base, and adding the remainder of said filler step-wise as a component of the overall gum composition in an amount of from

about 10% to about 30% by weight based on the weight of said gum composition, whereby said improvement provides said gum with increased softness without loss of film-forming characteristics, high cud volume retention during chewing, and a reduced requirement for water-soluble sweeteners without loss of perceived sweetness.

4,500,548

FERMENTATION AID FOR CONVENTIONAL BAKED GOODS

Roy F. Silva, Norwalk, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 15, 1982, Ser. No. 358,407
Int. Cl.³ A21D *2/22, 8/02*
U.S. Cl. 426—19 **24 Claims**

1. A method for preparing a fermentation aid for yeast-raised bakery goods containing volatile flavor and aroma components comprising: fermenting a mixture of flour, sugar in an amount ranging from 0 to about 10% by weight based on the weight of the flour, from about 55 to about 250 parts water per 100 parts flour and a yeast of the species *Saccharomyces cerevisiae* in an amount sufficient and for a minimum of 12 hours, said period of time being sufficient to decrease the pH of the mixture to a pH below 4.75: and drying the fermented mixture to a moisture content of from about 4.5% to about 9.0% under conditions such that a major amount of the volatile components of the mixture with the exception of water remain in the fermentation aid product after drying.

4,500,549

USE OF WHEY-DERIVED PRODUCTS AS CHEESE FLAVORING AGENTS OR ENHANCERS

Tommy L. Crossman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,735
Int. Cl.³ A23C *21/02*
U.S. Cl. 426—33 **17 Claims**

1. A cheese flavoring agent comprising hydrolyzed, enzymatically modified whole whey, said whole whey having had an initial lactose content of from about 2 percent to about 90 percent on a dry weight basis, said hydrozylate resulting from enzymatically modifying the whole whey with lipase, protease, or a combination of lipase and protease, and lactose hydrolyzing at least 30% of the initial lactose content.

4,500,550

CHEESE WITH MICRO-ORGANISM—CAUSED DECORATION ON ITS RIND AND PROCESS FOR PRODUCING SAME

Bernard Chauvin, Bauge, France, assignor to Bongrain S.A., Guyancourt, France

Filed Mar. 29, 1983, Ser. No. 480,145
Claims priority, application France, Mar. 31, 1982, 82 05571
Int. Cl.³ A23C *9/12*
U.S. Cl. 426—38 **11 Claims**

1. A permanently and indelibly decorated cheese, characterized in that its decoration, forming an integral part of the rind and inseparable therefrom, has at least two different colorations obtained by growth of different micro-organisms said micro-organisms being caused to develope on said cheese in a predetermined pattern.

3. The cheese according to claim 1, characterized in that at least one of its faces and/or its peripheral surface comprises a substantially flat surface in which is incorporated a sunken or relief graphic pattern and in that the substantially flat surface and the graphic pattern are coloured differently by growth of different micro-organisms.

6. A process for manufacturing the cheese of claim 3 which comprises impressing, before the cheese matures, a graphic pattern on at least one substantially flat surface and/or a peripheral surface of the cheese and then producing different colorations on the surface of the cheese and on the graphic pattern by the growth of different colored micro-organisms during maturing.

4,500,551

AGENTS FOR IMPROVING BREAD IN QUALITY AND BREAD CONTAINING SAME

Kenji Tanaka, Kawagoe, and Shigeru Endo, Tokyo, both of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 359,134, Mar. 17, 1982, abandoned.
This application Apr. 28, 1983, Ser. No. 489,592
Int. Cl.³ A21D *2/06, 2/22*
U.S. Cl. 426—62 **6 Claims**

1. An agent for improving bread in quality, said agent containing L-ascorbic acid, cystine and aspartic acid or glutamic acid in the proportion of 1 part by weight of ascorbic acid, 2.5 to 10 parts by weight of cystine based on the ascorbic acid used and 0.5 to 2 parts by weight of aspartic acid or glutamic acid based on the ascorbic acid used, said agent being present as 30–120 ppm of the weight of the flour.

4,500,552

GELATIN DESSERT PRODUCT

Sylvan Kadison, and David Scheiner, both of Chicago, Ill., assignors to Kadison Laboratories, Inc., Chicago, Ill.

Filed Jun. 13, 1983, Ser. No. 503,816
Int. Cl.³ A23L *1/04*
U.S. Cl. 426—96 **7 Claims**

1. A gelatin dessert product in the form of a dry pulverulent mixture capable, when dissolved in hot water and then chilled, of providing a flavored gelatin dessert having two clearly demarcated layers, each having a distinctly different color, comprising, as essential ingredients: about 50% to about 70%, by weight, sugar; about 15% to about 40%, by weight, of a dry edible oil component in the form of a dry mixture of an edible oil and an edible inert carrier wherein the edible oil comprises about 40% to about 60%, by weight, of the dry mixture; about 5% to about 15% gelatin; about 1% to about 3% of a quick setting agent in the form of a water soluble organic dibasic acid, for the gelatin; and about 0.5% to about 1.5% of a food grade acid.

4,500,553

METHOD OF PRODUCING A FROZEN DUAL-TEXTURED CONFECTION

Louis G. Liggett, Brooklyn, N.Y.; Kevin W. Lang, River Vale; Clement R. Wyss, Hillsdale, both of N.J., and Richard A. Williams, Plymouth, Minn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,353
Int. Cl.³ A23G *9/00, 9/26*
U.S. Cl. 426—101 **31 Claims**

1. A method of producing a frozen, dual-textured confection comprising a cream and gelatin-containing aerated phase and a fruit phase which comprises the steps of:

(a) dispersing the gelatin in water;

(b) combining the gelatin dispersion with the cream, milk solids, an emulsifier, a sweetener, and a gum stabilizer and homogenizing the combination so as to form a uniform emulsion having a gelatin content of from 0.8% to 2.5% by weight;

(c) passing the emulsion of (b) through a freezer in which the emulsion is simultaneously cooled, aerated and agitated to produce a partially frozen, aerated composition having ice crystals within the range of 10 to 150 microns and an overrun from 5% to 300%.

(d) combining pureed fruit and/or synthetic fruit flavor, water, a sweetener and a gum stabilizer to form a fluid, fruit phase component having a solids content between about 20% and 40% by weight;

(e) passing the partially-frozen, aerated composition in (c) together with a fruit component of (d) through a filler

head and into a mold or contaner at a ratio of from 99:1 to 1:1 by weight so that upon filling, the mold or container contains a cream and gelatin-containing phase and a fruit phase; and

(f) thoroughly freezing the contents of the mold or container.

4,500,554

WINE STABILIZATION USING IMMOBILIZED TANNIC ACID

Howard H. Weetall, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 14, 1983, Ser. No. 466,309

Int. Cl.[3] A23L *3/36;* **C12H** *1/04*

U.S. Cl. 426—323 **2 Claims**

1. A process for stabilizing wine comprises:

(a) copolymerizing formaldehyde and tannic acid attached to an insoluble carrier to form an immobilized tannic acid composite;

(b) contacting a wine, having components which cause haze formation upon heating, with the immobilized tannic acid for a period sufficient to remove the desired amount of haze components; and

(c) separating the treated wine from the immobilized tannic acid composite.

4,500,555

FISH SKINNING PROCESS

Wayne S. Chu, Agoura, Calif., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Nov. 7, 1983, Ser. No. 549,110

Int. Cl.[3] A22C *25/17*

U.S. Cl. 426—479 **14 Claims**

1. A process of skinning fish comprising:

a. applying an aqueous dispersion of an at least partially hydrolyzed starch to the skin of a fish;

b. drying the skin with the applied dispersion thereby causing the skin to at least partially peel away from the fish, and

c. removing the skin.

4,500,556

ANTHOCYANIN COLORANT FROM GRAPE POMACE

Metty S. K. Langston, Ossining, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 363,759, Mar. 31, 1982, abandoned. This application Apr. 19, 1983, Ser. No. 486,599

Int. Cl.[3] A23L *1/277, 1/272*

U.S. Cl. 426—540 **11 Claims**

1. A method for producing highly colored anthocyanin colorant from grape pomace which comprises:

Contracting grape pomace with an aqueous extractor solvent containing HSO_3 ions at room temperature to extract anthocyanin to form an unchanged anthocyanin-(HSO_3) complex;

Removing said aqueous extraction solvent from said grape pomace;

Removing undissolved solids from said aqueous extraction solvent;

Contacting said aqueous extraction solvent with a non-ionic adsorbent to adsorb said anthocyanin pigment from said aqueous extraction solvent;

Separating said aqueous extraction solvent and said adsorbent;

Contacting the separated adsorbent with water having a temperature ranging from 10° to 20° C. to remove water soluble non-pigmented material;

Contacting the separated adsorbent with an eluent acidifed with an acid having a pH ranging from 1 to 4, thereby breaking the anthocyanin-(HSO_3) complex, to produce a product solution comprising monomeric anthocyanin in its cationic form (free of said HSO_3 ions) which dissolves in said organic eluent; and

Separating said product solution from said adsorbent to produce a high tinctorial strength monomeric anthocyanin pigment.

4,500,557

LEAVENING ACID COMPOSITION

Thomas E. Edging, Nashville, Tenn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 18, 1982, Ser. No. 340,133

Int. Cl.[3] A21D *2/00;* **C01B** *15/16*

U.S. Cl. 426—563 **16 Claims**

1. A method for preparing a leavening acid composition comprising heating a potassium modified 1:3:8 sodium aluminum phosphate at a temperature above 200° C. for a period of time sufficient to reduce the L.O.I. to within the range of from about 11 to about 14, said time being insufficient to reduce the neutralizing value of said phosphate below 90, said composition being characterized by a baking powder rate of reaction ranging from about 15 c.c. to about 30 c.c. evolved CO_2 at 2 minutes, from about 18 c.c. to about 44 c.c. evolved CO_2 at 4 minutes and from about 24 c.c. to about 60 c.c. evolved CO_2 at 10 minutes.

4,500,558

MODIFICATION OF BRAN BY EXTRUSION

Charles V. Fulger, Millwood, and Allan G. Bradbury, Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 457,993, Jan. 14, 1983, abandoned. This application May 18, 1984, Ser. No. 611,651

Int. Cl.[3] A23L *1/10;* **A23P** *1/00*

U.S. Cl. 426—622 **6 Claims**

1. A process for the modification of bran comprising:

(a) combining bran with water to form a feed having a bran to water ratio of from 5.5:1 to 10:1; said bran containing from 10% to 25% starch on a dry weight basis, said starch either being naturally present in the said bran or admixed therewith;

(b) introducing the feed into a counter-rotating twin screw extruder;

(c) extruding the feed at a temperature of from 150° C. to 180° C.; and

(d) developing a shear rate of from 500 to 2000 seconds^{-1} in said extruder through which the said feed is extruded.

4,500,559

METHOD OF INCREASING THE ORGANOLEPTIC ACCEPTABILITY OF SHANK MEAT

Fredric G. Bender, Houston; Charles W. Everson, McMurray, and William E. Swartz, Upper St. Clair, all of Pa., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 14, 1983, Ser. No. 541,949

Int. Cl.[3] A23L *1/31*

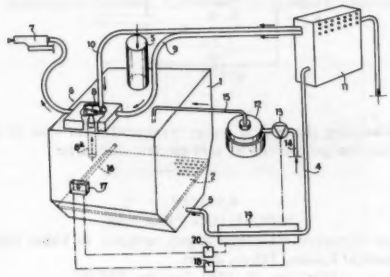
U.S. Cl. 426—646 **7 Claims**

1. A method for increasing the organoleptic acceptability of a meat product containing meat and fat, said meat consisting of shank meat, which comprises blending with said meat product a composition of autolyzed yeast extract and sodium tripolyphosphate hydrated with a solution containing citrus juice solids.

4,500,560
PROCESS FOR ENAMELLING OBJECTS ELECTROSTATICALLY BY MEANS OF A GUN

Gerard Guffroy, Vendome, France, assignor to De Dietrich & Cie, France

Filed Aug. 11, 1982, Ser. No. 407,036
Claims priority, application France, Feb. 9, 1982, 82 02038
Int. Cl.[3] B05D *1/06*
U.S. Cl. 427—8 7 Claims



1. A process for electrostatic enamelling objects and in particular hollow metallic objects by gun means and powdered enamel, comprising:

(a) generating a first air flow for conveying said powdered enamel towards said gun means;

(b) generating a second air flow for fluidizing said powdered enamel in a fluidization vessel and applying said second air flow into the bottom of said vessel;

(c) generating a steam flow second from said first or second air flows;

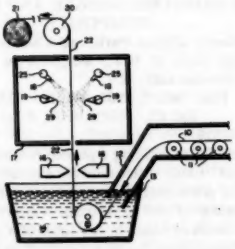
(d) applying said steam flow into the top of said vessel so as to moisten the fluidized powdered enamel contained therein; and

(e) conveying said fluidized moistened powdered enamel into said gun means by means of said first air flow.

4,500,561
MINIMIZATION OF SPANGLING ON HOT DIP GALVANIZED STEEL STRIP

Yong-Wu Kim; Phillip L. Coduti, both of Munster; Brian A. Sok, Cedar Lake, and William A. Carter, Munster, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Jul. 25, 1983, Ser. No. 516,997
Int. Cl.[3] B05D *1/04, 1/18*
U.S. Cl. 427—25 23 Claims



1. A method for minimizing spangle size on a hot dip galvanized steel strip, said method comprising the steps of:

withdrawing, from a bath of molten zinc, a steel strip having at least one exterior surface portion comprising molten zinc;

moving said withdrawn strip away from said bath in a direction having a vertical component;

providing said coated strip with an electrostatic charge having a first polarity;

providing particles of nucleating agent for initiating solidification of said molten zinc on said exterior surface portion, said particles having a mixed size range comprising small and large particles;

directing said particles, in relation to said vertically moving strip, so that at least the large particles in said size range move along a particle path which avoids impingement on said exterior surface portion;

and charging said particles of nucleating agent with an electrostatic charge having a second polarity opposite said first polarity to divert the small particles from said particle path toward said molten exterior surface portion for impingement substantially thereon only to initiate solidification thereof, while permitting said large particles to continue along a non-impinging particle path;

the continuation along said non-impinging particle path being limited to substantially said large particles.

4,500,562
DI-P-XYLYLENE POLYMER AND METHOD FOR MAKING THE SAME

Randy K. Jahn, and Raimond Liepins, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 2, 1983, Ser. No. 471,393
Int. Cl.[3] B05D *1/04, 1/06*
U.S. Cl. 427—27 10 Claims

1. A method of making a polymerized p-xylylene film, comprising the steps of:

subliming a solid di-p-xylylene at a first temperature to produce a sublimed di-p-xylylene vapor;

pyrolyzing said sublimed di-p-xylylene vapor at a second temperature higher than said first temperature to produce a p-xylylene vapor;

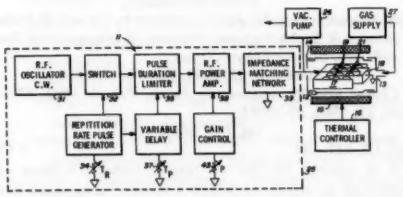
introducing said p-xylylene vapor into a deposition region wherein a low-temperature, low-pressure plasma is generated by means of an alternating electrical field applied to an inert gas in said region at a frequency of between approximately 30 and 300 hertz; and

condensing said p-xylylene vapor onto a solid substrate located within said deposition region.

4,500,563
INDEPENDENTLY VARIABLY CONTROLLED PULSED R.F. PLASMA CHEMICAL VAPOR PROCESSING

Charles E. Ellenberger; George L. Bower, both of Elko, Nev., and William R. Snow, Sunnyvale, Calif., assignors to Pacific Western Systems, Inc., Mountain View, Calif.

Filed Dec. 15, 1982, Ser. No. 434,859
Int. Cl.[3] C23C *13/08;* H01L *21/306*
U.S. Cl. 427—38 8 Claims



1. In a method for plasma enhanced chemical vapor processing of semiconductive wafers wherein an evacuable envelope contains first and second sets of interleaved electrodes, one set

being electrically insulated relative to the other, for establishing an electrical plasma discharge within said evacuable envelope in processing gaps defined between the interleaved electrodes, the steps of:

loading semiconductive wafers into the processing gaps;

evacuating said envelope to subatmospheric pressure;

introducing a vapor at subatmospheric pressure into said envelope;

applying pulsed radio frequency power to said first and second sets of interleaved electrodes to establish an electrical plasma discharge at subatmospheric pressure in the processing gaps to produce chemically active vapor products of said plasma discharge;

chemically interacting said chemically active vapor products with said wafers within said processing gaps for processing of said wafers; and

variably controlling the peak power level of the radio frequency power pulses essentially independently of the pulse duration and pulse repetition rate of said pulsed radio frequency power to variably control the distribution of the plasma discharge within said processing gaps for variably controlling the uniformity of the processing of the semiconductive wafers within the processing gaps.

6. In a plasma enhanced chemical vapor processing apparatus for processing semiconductive wafers within an evacuable envelope for containing the plasma enhanced chemical vapor and semiconductive wafers at subatmospheric pressure;

first and second sets of electrode means for disposition within the envelope, one set of said electrodes means being electrically insulated from the other, and said first and second sets of electrode means being interleaved with each other for establishing, when energized with electrical potential, an electrical plasma discharge within said evacuable envelope in the processing gaps defined between adjacent ones of said interleaved electrode means;

means for holding semiconductive wafers in said processing gaps;

means for applying pulsed radio frequency power to said first and second sets of interleaved electrodes to establish an electrical plasma discharge at subatmospheric pressure in said processing gaps to produce chemically active vapor products of said plasma discharge for chemically interacting with said wafers within said processing gaps for processing of said wafers; and

means for variably controlling the peak power level of the radio frequency power essentially independently of the pulse duration and the pulse repetition rate of said pulses for variably controlling the distribution of the plasma discharge within said processing gaps for variably controlling the uniformity of the processing of the semiconductive wafers within said processing gaps.

4,500,564

METHOD FOR SURFACE TREATMENT BY ION BOMBARDMENT

Yuji Enomoto, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,937

Claims priority, application Japan, Feb. 1, 1982, 57-14638; Mar. 23, 1982, 57-45994

Int. Cl.³ B05D *3/06*

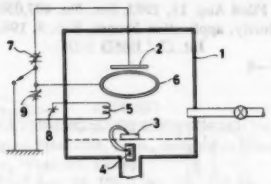
U.S. Cl. 427—39 **3 Claims**

1. A method for the ion bombardment treatment of the surface of an article on which a metallic compound is to be vapor deposited by reactive ion plating, which comprises the steps of:

placing the article under treatment in a reaction gas at a pressure within the range of 10^{-3} to 10^{-4} Torr;

causing a hot filament to release thermoionic electrons in said reaction gas, thereby inducing electric discharge;

applying a negative voltage to the article; and



bombarding the article under treatment with ions of the reaction gas ionized by said electric discharge.

4,500,565

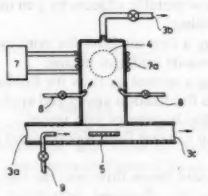
DEPOSITION PROCESS

Tatsumi Hiramoto, Machida, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1983, Ser. No. 536,517

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—39 **8 Claims**



1. A deposition process which comprises, in an air-tight reaction vessel, generating through a discharge gas by means of a discharge system a light-radiating plasma producing species, disposing a substrate at a position spaced from the plasma by a distance greater than the mean free path of the species produced by the plasma such that the substrate is exposed directly to light radiated from the plasma, feeding a carrier gas and photoreactive gas in such a manner that said carrier gas and photoreactive gas flow along the substrate, and causing the photoreactive gas to undergo a reaction by the light from the plasma to produce a reaction product, and to deposit the reaction product on the substrate.

4,500,566

BUBBLE PRESSURE BARRIER AND ELECTRODE COMPOSITE

Bradley R. Karas, Clifton Park, and Charles E. Baumgartner, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

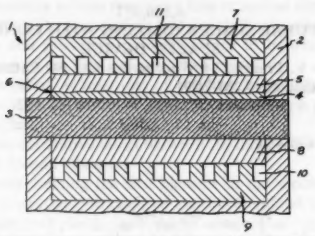
Filed Oct. 7, 1982, Ser. No. 433,314

Int. Cl.³ H01M *4/88, 8/00*

U.S. Cl. 427—115 **3 Claims**

1. A process for producing a porous bubble pressure barrier having metal oxide distributed substantially uniformly throughout its pores and having at least one face free of any significant amount of said metal oxide which comprises providing a porous sintered blank in the form of a plaque comprised of a metal selected from the group consisting of nickel, copper, an alloy of nickel and copper, and an alloy of nickel and up to about 10 weight % chromium, said blank having a median pore size ranging from about 1 micron to about 10 microns, and a pore volume ranging from about 40% to about 75% by volume of the total volume of said blank, immersing said blank in a fluid organometallic precursor for a metal oxide selected from

the group consisting of aluminum oxide, titanium oxide, iron oxide, zinc oxide and cerium oxide, subjecting said fluid to a vacuum sufficient to at least substantially evacuate the pores of said immersed blank and at least significantly fill said evacuated pores with said fluid, retrieving the resulting precursor-filled blank, removing said precursor from at least one face of said blank leaving no significant amount thereof, infiltrating said precursor-filled-blank with water or steam hydrolyzing said precursor within the pores of said blank producing a hydrolyzed product, first firing the resulting hydrolyzed product-containing-blank to convert said hydrolyzed product to said metal oxide leaving no significant amount of said hydrolyzed product therein at a temperature ranging from the temperature at which said product decomposes to said metal oxide to less than about 600° C., and second firing the resulting metal oxide-containing-blank to remove any water which may be present therein at a temperature ranging from about 600° C. to about 700° C., said first and second firings being carried out at or about atmospheric pressure in a reducing atmosphere, said first and second firings having no significant deleterious effect on said bubble pressure barrier.



4,500,567
METHOD FOR FORMING TIN OXIDE COATING

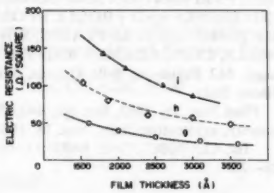
Yukihiro Kato, Nishinomiya; Hideo Kawahara, Toyonaka, and Masato Hyohdou, Itami, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Dec. 19, 1983, Ser. No. 562,726

Claims priority, application Japan, Dec. 23, 1982, 57-230376; Mar. 7, 1983, 58-37136

Int. Cl.³ C23C *11/00, 13/00*

U.S. Cl. 427—255.3 **4 Claims**



1. In a method for forming a fluorine-containing tin oxide coating on the surface of a substrate selected from the group consisting of glass, ceramics and metals which comprises contacting the heated surface of the substrate with a mixed vapor of a tin compound and a doping agent composed of a fluorine-containing compound to oxidize and decompose the mixed vapor thermally and deposit fluorine-containing tin oxide thereon; the improvement wherein monobutyltin trichloride is used as the tin compound, and a fluorine compound of the following formula

$$XCHF_2$$

wherein X represents a fluorine atom, a chlorine atom, or a hydrocarbon group consisting only of carbon and hydrogen atoms, is used as the doping agent.

4,500,568
PRESERVATION OF STRUCTURES

Leonard L. Pearson, Slough, and John Litchfield, Croydon, both of England, assignors to Cole Polymers Limited, Surrey, England

Filed Dec. 7, 1981, Ser. No. 328,432

Claims priority, application United Kingdom, Dec. 6, 1980, 8039210

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—294 **14 Claims**

1. A method of in situ strengthening, without discoloring, a pre-existing structure made of stone, brick, concrete, concrete reinforced with metal reinforcement, wood, or the like, and existing in an ambient environment, comprising the steps of: drawing a vacuum in a portion of the structure and while maintaining the vacuum drawing into the structure a liquid of low viscosity, the liquid comprising a monomer and a polymer, the liquid polymerised to a degree of polymerisation between about 8 percent and about 12 percent w/w/; and curing the liquid at ambient temperature.

4,500,569
PALLADIUM (II) BIS (HEXAFLUOROACETYLACETONATE), ADDUCTS DERIVED THEREFROM AND USES THEREOF

Allen R. Siedle, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 351,505, Feb. 23, 1982, Pat. No. 4,410,569, which is a division of Ser. No. 159,367, Jun. 13, 1980, Pat. No. 4,424,352. This application Jun. 30, 1983, Ser. No. 509,956

Int. Cl.³ B05D *3/04*

U.S. Cl. 427—304 **9 Claims**

1. A method comprising the steps:

(1) coating a solution of an adduct of palladium(II) bis(hexafluoroacetylacetonate) onto a basic substrate, said adduct of palladium(II) bis(hexafluoroacetylacetonate) having the formula

$$Pd(F_6ACAC)_2.L_n$$

wherein

F_6ACAC is the hexafluoroacetylacetonate anion,

L is a Lewis base and n is an integer 1 to 4, with the provisos that

when n is 1, 2, 3 or 4, L is dimethylethylamine, benzylamine, imidazole, pyrazine, pyrazole, triphenylstibine, benzothiazole, or tert-butylisocyanide,

when n is 1, 2, or 3, L is ammonia, methylamine, dimethylamine, or pyridine,

when n is 1 or 2, L is trimethylamine, triphenylphosphine, triphenylarsine, 1,4-dithiane, alumina, silica, or aluminosilicates,

when n is 4, L is benzoselenazole,

when n is 2, L is 1,2-bis(diphenylphosphino)ethane, phenothiazine, or phenoselenazine,

when n is 1, L is phenazine, trimethylpyridine, bis(2-diphenylphosphinoethyl)phenylphosphine, phenoxathiin, tetrathianaphthalene, tetrathiatetracene, benzylmethylsulfide, diethylsulfide, or bis(diphenylphosphino)acetylene,

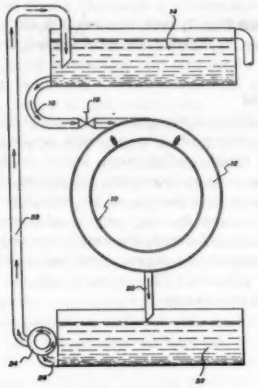
(2) evaporating the solvent from the resulting coating, and

(3) reducing the resulting solvent-free coating to provide a catalytically active surface of palladium.

4,500,570
PIPELINE PRIMING METHOD AND SYSTEM

Robert G. Goekler, London, England, assignor to Crutcher Resources Corporation, Houston, Tex.

Continuation of Ser. No. 949,860, Oct. 10, 1978, abandoned, which is a continuation of Ser. No. 795,207, May 9, 1977, abandoned. This application Sep. 8, 1980, Ser. No. 185,285
Int. Cl.³ B05D 1/28, 1/30
U.S. Cl. 427—345 10 Claims



1. A method of applying a primer coating to a pipeline, comprising the steps of:

moving a cylindrical body of liquid primer along said pipeline while contacting said pipeline fore and aft of said body by non-metallic bristle rings which serve to confine and define said body;

wiping to a predetermined thickness the primer on said pipe aft of said rings while moving excess primer forward for collection and recirculation to said body; and

establishing an inert gas flow in the zones occupied by said primer.

4,500,571
PICTURE

William A. Jones, P.O. Box 189, Everett, Wash. 98201

Continuation-in-part of Ser. No. 284,939, Jul. 20, 1981,. This application Sep. 29, 1982, Ser. No. 426,604
Int. Cl.³ B44C 5/04
U.S. Cl. 428—13 8 Claims

1. A picture comprising,

a transparent panel having continuous, regular, and uniform opposite surfaces,

transparent substances on a selected one of said surfaces contrasting in color with the panel forming particles in form raised from that surface, the particles being distributed on that surface, and being selectively and individually so dimensioned and proportioned and positioned relative to each other as to form a predetermined picture independently of and separate from that portion of that surface devoid of said substances,

said substances being uncovered and exposed and constituting the sole means of forming the picture, and

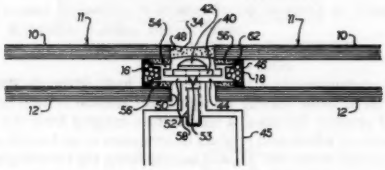
means enclosing one side of the panel with light absorbing material,

the transparency of the substances enabling light to enter thereinto from the uncovered side of the panel, and the substances being capable of reflecting light from the front side thereof and from the rear side thereof.

4,500,572
STRUCTURAL SPACER GLAZING WITH CONNECTING SPACER DEVICE

Geoffrey V. Francis, 14 Woodgarden Ct., St. Catharines, Ontario, Canada (L2M 7C9)

Filed Jun. 30, 1983, Ser. No. 509,652
Int. Cl.³ E06B 3/24
U.S. Cl. 428—34 36 Claims

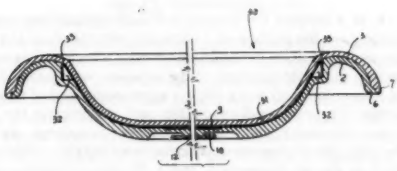


1. A glass insulating sealed unit capable of being mounted on a building without the use of exterior stops comprising at least two spaced-apart glass plates and spacer means to join and seal the edge portions of said glass plates arranged about the entire periphery of said plates and between said plates, said spacer means including at least one connecting spacer device extending along at least one side of said unit, projecting therefrom, and adapted for the connection of said unit to an adjoining support member in order to support and fix said unit so that the exterior glass suface thereof is the outermost point of the unit and adjacent surrounding surfaces of said building.

4,500,573
PROCESSES FOR MANUFACTURING SPECIFIC PRODUCTS SUITABLE FOR THE STORAGE, TRANSPORT, PREPARATION AND CONSUMPTION OF FOOD, AND DRINKS AND PRODUCTS OBTAINED BY SAID PROCESSES, SUCH AS PLATES, SOUP PLATES, VESSELS, CUPS, GLASSES AND THE LIKE

Alberto Piaggi, 542 Residenza delle Querce, Milano Due, Segrate (Milan), Italy

Filed Nov. 16, 1982, Ser. No. 442,033
Claims priority, application Italy, Nov. 18, 1981, 25161 A/81
Int. Cl.³ B29C 27/08; B65D 11/16
U.S. Cl. 428—35 14 Claims



1. A process for peparing a multi-layered decorative plastic article for holding food comprising

injection molding a second element having an inner surface,

an outer surface and an outer lip, said second element being injection molded from plastic which is adapted to hold food, and said outer surface being shaped to be in contact with said food,

injection molding a first base element having an inner surface, an outer surface and an outer lip, said base element inner surface and outer lip being molded so that it is substantially complementary with the second element inner surface and outer lip,

providing a decorative insert, said decorative insert having at least one surface thereof with a decoration thereon,

injection molding at least one of the first or second elements inner surfaces to accomodate said decorative insert therebetween and provide a complementary fit between the inner faces of the first and second elements,

injection molding at least one of the first and second elements with plastic material that forms a transparent plastic after molded,

inserting the decorative insert between the inner faces of the first and second elements,

ultrasonically welding the first element to the second element to thereby provide the desired multilayered food holder.

8. A multilayered plastic food holder comprising:

a second injection molded plastic element having an inner surface, an outer surface and an outer lip, said outer surface being the surface to hold or be in contact with food,

a first injection molded plastic base element having an inner surface, an outer surface and an outer lip,

a separate decorative insert being positioned between the inner surfaces of said first and second elements,

said inner surfaces of said first and second elements being adapted to hold said decorative insert and being complementary with each other,

at least one of said first and second elements being formed of transparent plastic to enable the decorative layer to be visible therethrough,

said first and second elements being joined together by ultrasonic welding.

4,500,574

END CLOSURE FOR SAUSAGE CASINGS

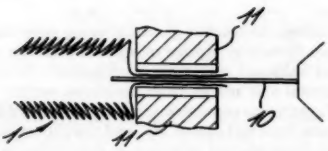
Allan J. Hanlon, Stirling, Scotland, assignor to Devro, Inc., Somerville, N.J.

Filed Feb. 4, 1983, Ser. No. 463,767

Claims priority, application United Kingdom, Feb. 9, 1982, 8203687

Int. Cl.³ A22C *13/00*

U.S. Cl. 428—35 **2 Claims**



1. A shirred strand of sausage casing closed at one end by an end-closure constituted by a crimped end portion of the strand which is deshirred to remove transverse folds and in which opposite sides of the casing are adhesively secured together around a removable pin so as to form a partial seal having a precisely sized restricted air passage having a diameter of from 0.25 to 1 mm therethrough.

4,500,575

HOT-MELT ADHESIVE OF A COPOLYESTER OF A DIBASIC ACID WITH A POLYHYDRIC ALCOHOL

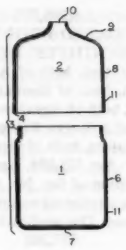
Kazuo Taira, Tokyo; Akihiko Morofuji, Yokohama; Hiroshi Ueno, Yokosuka, and Seishichi Kobayashi, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 543,148

Claims priority, application Japan, Oct. 28, 1982, 57-188141

Int. Cl.³ B65D *0/00*; C08G *63/02*

U.S. Cl. 428—35 **7 Claims**



7. In a bottle-shaped metal vessel having a circumferential side seam formed by lap-bonding circumferential open ends of cup-shaped upper and lower members obtained by draw forming or draw-ironing forming of a metal blank through an adhesive, the improvement wherein said adhesive comprises a copolyester of a dibasic acid component comprising 70 to 97 mole % of terephthalic acid and 3 to 30 mole % of other dibasic acid with a polyhydric alcohol component comprising 70 to 97 mole % of 1,4-butane-diol, 3 to 30 mole % of diethylene glycol and up to 20 mole % of other polyhydric alcohol having 2 to 5 carbon atoms, said copolyester having a reduced viscosity of at least 0.6 dl/g as measured at a temperature of 30° C. in a phenol/tetrachloroethane mixed solvent having a phenol/tetrachloroethane weight ratio of 60/40 at a polymer concentration of 0.25 g/100 ml, a glass transition temperature of at least 31° C. and a crystallinity of 15 to 40%.

4,500,576

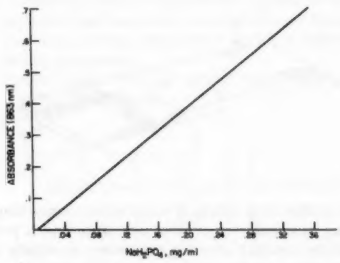
INHIBITION OF DISCOLORATION ON CELLULOSE FOOD CASINGS

Myron D. Nicholson, Lockport, and Herman Chiu, Chicago, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 14, 1983, Ser. No. 466,302

Int. Cl.³ F16L *11/00*

U.S. Cl. 428—36 **31 Claims**



1. A cellulosic food casing treated with a composition for inhibiting the formation of discoloration and black spots upon said casing, said casing containing a liquid smoke solution derived from natural wood and containing smoke color, odor

and flavor constituents, said composition comprising an agent having the ability to prevent the progressive oxidation of metals; said agent being selected from the group consisting of a coordination compound and a reducing agent, wherein said reducing agent is selected from the group consisting of hydrogensulfide, sulferdioxide, and sodium hydrosulfite.

4,500,577

METAL PIPE COATED WITH THERMOPLASTIC SYNTHETIC RESIN

Jiro Satake; Tetsuzo Arai, both of Amagasaki; Kivokazu Tanaka; Eiji Mikami, both of Ibaraki; Tsuneo Moriyasu, and Tadasu Nakagawa, both of Neyagawa, all of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha and Nippon Paint Kabushiki Kaisha, both of Osaka, Japan

Continuation of Ser. No. 371,854, Apr. 26, 1980, abandoned, which is a continuation of Ser. No. 148,338, May 9, 1980, abandoned, which is a continuation-in-part of Ser. No. 026,382, Apr. 2, 1979, abandoned. This application Dec. 1, 1983, Ser. No. 557,388

Claims priority, application Japan, Apr. 7, 1978, 53-41594

Int. Cl.³ B32B *1/08*

U.S. Cl. 428—36 **2 Claims**

1. A coated metal pipe having the exterior surface thereof coated with a protective film of a thermoplastic synthetic resin through an adhesive material consisting essentially of:

(a) about 10% by weight of an oil soluble alkyl phenol resin

(b) about 30% by weight of an ethylene-ethylacrylate resin having a melt index of 25

(c) about 25% by weight butyl rubber and

(d) about 30% of aliphatic petroleum resin having a softening point of 130° C.,

the balance being inorganic filler material.

4,500,578

ENDLESS LOOP ARTICLES OF MANUFACTURE, STRAPS SHAPED THEREFROM, AND MATS MADE FROM SUCH STRAPS

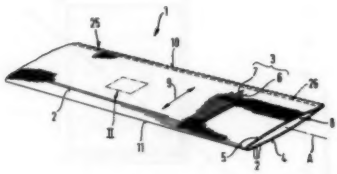
Dieter van de Kamp, Bad Pyrmont, Fed. Rep. of Germany, assignor to Spanset Inter AG, Basel, Switzerland

Filed Feb. 21, 1984, Ser. No. 581,900

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 8304806[U]

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—36 **23 Claims**



1. An endless loop article of manufacture comprising a core consisting essentially of at least one skein and a protective substantially toroidal covering consisting essentially of hose fabric, having a central loop axis and loosely enclosing said core,

said hose fabric comprising a warp threading and a weft threading,

said weft threading comprising at least one monofilament thread extending transverse to said central loop axis.

4,500,579

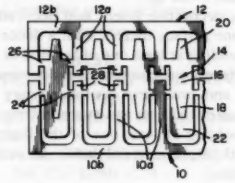
STICKS OF PARTS AND THEIR USE

Alexander R. Norden, 350 Central Park West, New York, N.Y. 10025

Filed Sep. 29, 1982, Ser. No. 428,382

Int. Cl.³ B32B *1/04, 15/00*

U.S. Cl. 428—43 **18 Claims**



1. A strip of parts for gang-assembly to companion portions of a receptor, said strip of parts being a sheet-metal stamping including a row of mutually spaced-apart parts and a break-away strip extending alongside the row of parts and having projecting portions disposed in the spaces between said parts and joined to those parts by a row of connections that extends along the row of parts, said connections being weakened by incisions transverse to the row of connections, to the break-away strip and to the row of parts, so that rocking of the break-away strip relative to the row of parts about an axis along the row of connections tends to tear the connections.

4,500,580

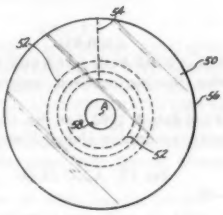
TAPING DOUGHNUT

Wayne Luciani, 1797 Litchfield Tpke., Woodbridge, Conn. 06525

Filed Jul. 11, 1983, Ser. No. 512,351

Int. Cl.³ B32B *3/10, 29/00*

U.S. Cl. 428—43 **10 Claims**



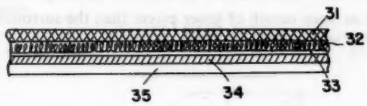
1. In a building construction system, a taping paper used for sealing a gap formed by a piece of wallboard and an object piercing said wallboard comprising a substantially flat surface having a central axis and an outer peripheral surface and a plurality of continuous concentric tear lines spaced at different radial distances from said central axis, said plurality of continuous tear lines being adapted to be torn so as to define an opening through which said object piercing said wallboard fits and further including a non-continuous tear line extending from said outer peripheral surface of said substantially flat surface in the direction of said central axis wherein said non-continuous tear line intersects said plurality of continuous concentric tear lines wherein said non-continuous tear line is adapted to be torn so as to define an opening for fitting said taping paper over said object such that said object fits into said opening defined by the torn continuous tear line.

4,500,581

MATERIAL FOR PROTECTING HUMAN BODIES FROM HARMFUL OR POISONOUS CHEMICAL SUBSTANCE

Takeshi Mitomi; Eiji Yoshimura, and Hideki Komagata, all of Otsu, Japan, assignors to Boseki Kabushiki Kaisha, Japan

Filed Mar. 19, 1982, Ser. No. 360,083
Claims priority, application Japan, Mar. 20, 1981, 56-41048
Int. Cl.³ B32B *3/02*
U.S. Cl. 428—85 **21 Claims**



1. A protective material, adapted to protect human bodies from chemical substances, comprising (A) a cloth layer having a buffed or piled surface layer which is adapted to prevent a chemical substance in a liquid state from penetrating the cloth layer and which has an apparent density (according to the formula: $D=W/100\times T$, where D is the apparent density of the layer being measured (g/cm^3), W is the weight of the layer being measured, and T is the thickness of the layer being measured (mm)) smaller than that of the entire body of the cloth layer, and (B) an active carbon layer adapted to absorb a chemical substance in a gaseous state integrally provided on the other surface of the cloth layer.

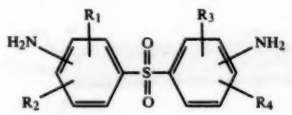
4,500,582

MODIFIED AMINE HARDENER SYSTEMS

John J. King, East Haven, Conn.; Ralph F. Sellers, Somerset, N.J., and Richard N. Castonguay, Danbury, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 267,117, May 26, 1981, Pat. No. 4,330,659, which is a continuation-in-part of Ser. No. 194,094, Oct. 6, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,358
Int. Cl.³ C08G *59/50*; B32B *3/12*
U.S. Cl. 428—116 **16 Claims**

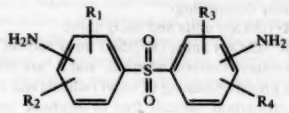
1. A honeycomb structure comprising skins bonded to each side of a honeycomb core, said skins comprising the cured product of a wound yarn impregnated with a curable mixture comprising a polyepoxide compound and a hardener comprising the adduct obtained from the reaction of a diamino diphenylsulfone corresponding to the formula



wherein R_1, R_2, R_3 and R_4 are independently hydrogen, straight and branched chain alkyl of 1 to 12 carbon atoms or halogen,

and a diglycidyl ether of a polyhydric phenol; said hardener having from about 2.5 to 100 equivalents of aminohydrogen per equivalent of epoxy.

9. A laminate structure comprising the cured, compression molded product of a wound yarn impregnated with a curable mixture comprising polyepoxide compound and a hardener comprising the adduct obtained from the reaction of a diamino diphenylsulfone corresponding to the formula



wherein R_1, R_2, R_3 and R_4 are independently hydrogen, straight and branched chain alkyl of 1 to 12 carbons or halogen,

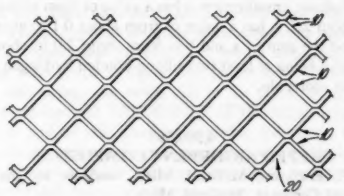
and a diglycidyl ether of a polyhydric phenol; said hardener having from about 2.5 to 100 equivalents of aminohydrogen per equivalent of epoxy.

4,500,583

HONEYCOMB STRUCTURE

George M. Naul, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 12, 1983, Ser. No. 531,101
Int. Cl.³ B32B *3/12*
U.S. Cl. 428—116 **6 Claims**



1. Honeycomb structure comprising corrugated sheet units molded of resin impregnated glass wool and adhered together to form a cellular core.

4,500,584

TRANSPARENT MEMBRANE STRUCTURES

Frank J. Modic, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jul. 7, 1983, Ser. No. 511,704
Int. Cl.³ B32B *5/02*
U.S. Cl. 428—145 **42 Claims**

1. A roofing fabric membrane structure article of manufacture comprising:

(a) a base fabric material,

(b) a base coating composition applied to at least one surface of said base fabric material, and

(c) a silicone coating composition applied to at least one surface of said base fabric material already having thereon said base coating composition which is resistant to dirt pickup comprising:

(i) 100 parts of a liquid vinyl chainstopped polysiloxane having the formula,

where R and R^1 are monovalent hydrocarbon radicals free of aliphatic unsaturation with at least 50 mole percent of the R^1 groups being methyl, and where n has a value sufficient to provide a viscosity up to about 2,000,000 centipoise at 25° C.;

(ii) 100–200 parts of a resinous organopolysiloxane copolymer comprising:
(i) $(R^2)_3SiO_{0.5}$ units and SiO_2 units,
(ii) $(R^3)_3SiO_{0.5}$ units, $(R^3)_2SiO$ units and SiO_2 units, or
(iii) mixtures thereof, where R^2 and R^3 are selected from the group consisting of vinyl radicals and monovalent hydrocarbon radicals free of aliphatic unsaturation, where from about 1.5 to about 10 mole percent of the silicon atoms contain silicon-bonded vinyl groups, where the ratio of monofunctional units to tetrafunctional units is from about 0.5:1 to about 1:1, and the ratios of difunctional units to tetrafunctional units ranges up to about 0.1:1;
(iii) a platinum or platinum-containing catalyst; and
(iv) a liquid organohydrogenpolysiloxane having the formula,

$$(R)_a(H)_bSiO_{\frac{4-a-b}{2}}$$

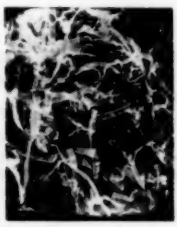
sufficient to provide from about 0.5 to about 1.0 silicon-bonded hydrogen atoms per silicon-bonded vinyl group, R is a monovalent hydrocarbon radical free of aliphatic unsaturation, a has a value of from about 1.0 to about 2.1, b has a value of from about 0.1 to about 1.0, and the sum of a and b is from about 2.0 to about 2.7, there being at least two silicon-bonded hydrogen atoms per molecule.

4,500,585

CREPED ABSORBENT COMPOSITES

Robert E. Erickson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 3, 1982, Ser. No. 373,930
Int. Cl.³ B32B *3/28, 27/10*
U.S. Cl. 428—152 **17 Claims**



1. A creped hydrophilic absorbent composite which has a rapid absorption rate and has a soft hand at low relative humidities which comprises the product produced by
(a) reducing the moisture content of a composite of a water-swellable hydrophilic polymer with wicking substrates to less than 8% by weight by passing said composite through a drying zone, and
(b) passing said dried composite through a creping zone wherein said polymer is fractured and broken into pieces which remain essentially laminated to said substrates.

4,500,586

BILLOWED FILLING ELEMENTS FOR PACKAGING

Harry Bussey, Jr., P.O. Box 115 Serpentine Rd., Navesink, N.J.

Continuation of Ser. No. 230,113, Feb. 28, 1981, abandoned. This application Oct. 28, 1982, Ser. No. 441,331
Int. Cl.³ B32B *1/00, 27/00*
U.S. Cl. 428—174 **9 Claims**

1. A loose fill packing element of expanded resilient thermoplastic material, said element having a shell-like body defining a hollow billowed shape with a free inturned peripheral edge

defining an open mouth of lesser extent than the surrounding portions of said body.

4,500,587

GRAPHIC ARTS FILM AND METHOD OF PREPARING SAME

Tadami Kamaishi, Otsu, and Takao Kitagawa, Shiga, both of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan

Filed Oct. 12, 1982, Ser. No. 433,668
Claims priority, application Japan, Oct. 14, 1981, 56-162696
Int. Cl.³ B32B *3/18, 9/04;* **B41M** *5/20*
U.S. Cl. 428—204 **20 Claims**

1. A graphic arts film having an image thereon created by electrophotography, said film comprising;
(a) a light transmitting base sheet having a light transmittance of not less than 70%,
(b) a toner-adhesive and ink-repellent, transparent coating layer formed from an elastomeric silicon resin, said layer being formed on said base sheet,
(c) a toner bonded imagewise onto said transparent coating layer by electrophotography, with the contrast between said nonimaged base sheet and said image defined by said toner being enhanced by,
(d) a permanently cured ink layer formed selectively on only the toner image area, wherein the combined optical density of the image area on the film with said ink layer adhered thereto is not lower than 2.5.

4,500,588

CONVEYOR FELT FOR PAPER MAKING AND A METHOD OF MANUFACTURING SUCH A FELT

Kristian Lundström, Pirkkala, Finland, assignor to Tamfelt Oy AB, Tampere, Finland

Filed Dec. 3, 1982, Ser. No. 446,623
Claims priority, application Finland, Oct. 8, 1982, 823431
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—212 **14 Claims**

1. A conveyor felt for supporting and conveying a fibre web through a press section of a paper machine, said conveyor felt comprising at least one needled fibre bat layer, wherein said fibre bat layer, except for a surface portion thereof facing the web, includes a resinous or elastomeric air impermeable filling material filling pores of the bat between individual fibres thereof so that the bat layer is substantially entirely air impermeable, said filling material tending to prevent rewetting of the felt and eliminate compressibility of the conveyor felt to prevent the occurrence of blowing as the felt is compressed in a press nip so that the fibre web does not lift off the felt.

4,500,589
LAMINATE OF ALUMINUM SHEET MATERIAL AND ARAMID FIBERS

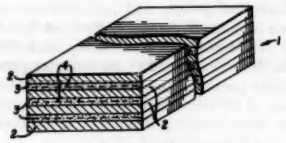
Jacobus Schijve, Pijnacker; Laurens B. Vogelesang, Nieuwkoop, both of Netherlands, and Roelof Marissen, Cologne, Fed. Rep. of Germany, assignors to Technische Hogeschool Delft, Delft, Netherlands

Continuation of Ser. No. 388,037, Jan. 8, 1982, abandoned. This application Sep. 20, 1983, Ser. No. 533,883

Claims priority, application Netherlands, Jan. 9, 1981, 8100087

Int. Cl.³ B32B *15/08*

U.S. Cl. 428—213 **14 Claims**



1. A fiber-reinforced laminate adapted for use as a structural component of an aircraft, comprising:

at least two sheets of an aluminum alloy, each of said sheets having a thickness of less than 1 mm and a tensile strength of greater than 350 N/mm^2;

an adhesive layer located between each adjacent pair of said sheets, said adhesive layer comprising a thermohardening material disposed between the sheets to bond an adjacent pair of the sheets together;

aromatic polyamide fibers disposed in each said adhesive layer to reinforce the laminate, said fibers comprising polyparaphenylene terephthalamide yarns made up of endless filaments formed from a material having a modulus of elasticity in the range of 5×10^4 to 25×10^4 N/mm^2 and an elongation at breakage of at least 2%, said yarns being disposed in substantially straight parallel lines in the adhesive layer and being present in an amount of 20 to 80% by weight based on the combined weight of the thermohardening material and the yarns,

the thickness of each of the sheets being greater than the thickness of each said adhesive layer containing said fibers.

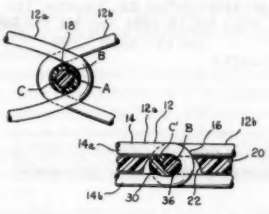
4,500,590
DRYER FABRIC HAVING REDUCED PERMEABILITY IN THE AREA OF THE PINTLE JOINT

Richard W. Smith, Greenville, S.C., assignor to Wangner Systems Corporation, Greenville, S.C.

Filed Jun. 25, 1984, Ser. No. 624,114

Int. Cl.³ D04H *3/07*; D21F *1/10*

U.S. Cl. 428—222 **25 Claims**



1. A permeable dryer belt fabric for use in drying paper in the dryer section of a paper making machine comprising:

a plurality of polymeric helix strips comprised of windings and winding arcs;

said helix strips being intermeshed together so that the winding arcs of adjacent helix strips intermesh with one another to define a pintle channel through said arcs;

a polymeric pintle core extending through said pintle channel to form a pintle joint and join adjacent helix strips together to form a mesh fabric having an open mesh pattern;

said pintle core having a crimped configuration with alternated bends engaged by a bight of alternating winding arcs of adjacent helix strips; and

a low-melt polymeric material carried generally around said pintle core which has been heat softened so that said material flows and exhibits a flow profile projecting generally in the direction of said bends in said crimped pintle core to fill void areas in said mesh pattern in an area of said pintle joint, said low-melt material retaining its solid properties in said flow profile.

7. A method for producing a permeable dryer belt fabric for use in drying paper in the dryer section of a papermaking machine wherein the dryer belt fabric is of the type which is produced by providing a plurality of helix strips having windings with winding arcs which have been joined together by intermeshing the winding arcs of adjacent helix strips with one another to define a pintle channel and inserting a pintle through said pintle channel to form a pintle joint which joins said helix strips together resulting in formation of a mesh fabric having an open mesh pattern, heat setting said joined intermeshing helix strips to cause said pintle to be crimped and exhibit alternating side bends due to the fabric being placed under a tension and said windings of the helix strips being caused to pull on said pintle in opposing directions, wherein said method comprises selecting a composite pintle having a polymeric core material and an outer sheath material which has a lower melt point than the core material so that said sheath material softens preferentially to flow in the direction of said alternating bends of said pintle core during heat treatment of said fabric whereby a profiled flow of said sheath material projects into a portion of the void spaces of said mesh pattern in an area of said pintle joint.

4,500,591
FOAM RUBBER BACKINGS FOR COMPOSITE MATERIALS HAVING GLASS FIBER SUBSTRATES COATED WITH PVC

Gerard Peltier, Schiltigheim; Michel Longuet, Haguenau, both of France, and Charles A. Midgley, Sarnia, Canada, assignors to Polysar International S.A., Fribourg, Switzerland

Filed Jun. 21, 1983, Ser. No. 506,318

Claims priority, application France, Jun. 21, 1982, 82 10802

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—251 **14 Claims**

1. A composite material comprising a woven or non-woven glass fiber substrate which is coated with a gelled plastisol of a co- or homo-polymer of vinyl chloride having formed on one surface of said glass substrate and integrally bonded thereto during the process of its formation a foam formed from a compound comprising a latex having a bulk polymer composition comprising

(a) from about 0 to about 30 percent by weight of a vinyl or vinylidene monoaromatic monomer which may be unsubstituted or substituted by a C_{1-4} aliphatic radical or a bromine or chlorine radical;

(b) from about 60 to about 85 percent by weight of a C_{4-6} aliphatic conjugated diene monomer; and

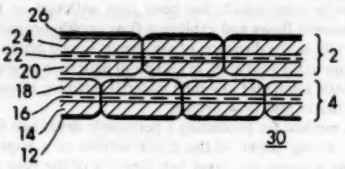
(c) from about 3 to about 40 percent by weight of a polar monomer selected from the group consisting of C_{2-9} ethylenically unsaturated amide, aldehyde, carboxylic acid, and nitrile monomers, and C_{1-6} esters of said carboxylic acid monomers.

4,500,592

COMPOSITE THERMAL INSULATION LINER

Calvin K. Lee, Needham, and Deirdre T. Rapacz, Natick, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 22, 1984, Ser. No. 623,755
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—251 **15 Claims**



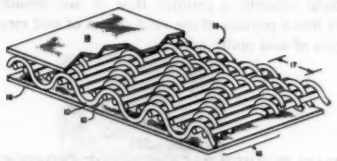
1. A thermal insulation liner comprising a plurality of reflective film plies, a plurality of fibrous flame retardant batting plies and two outer woven glass fabric cover plies wherein at least one batting ply lies between each of said outer cover plies and said reflective plies.

4,500,593

PROTECTIVE FABRIC AND FIRE CURTAIN WITH A METALLIC LAMINATE

John W. Weber, 1929 Gravers Rd., Norristown, Pa. 19401

Continuation-in-part of Ser. No. 211,815, Dec. 1, 1980,. This application Aug. 22, 1983, Ser. No. 525,328
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—257 **20 Claims**



1. A high temperature resistant fabric comprised of yarns, having a core of high temperature resistant refractory material silica and covering of a second high temperature resistant fiber selected from the group consisting essentially of aramid, phenolic, polyacrylonitrile and polybenzimidazole fibers, and a metallic laminate.

4,500,594

PROCESS FOR PREPARING MULTILAYER FIBROUS STRUCTURES AND PRODUCT

Lino Credali, Casalecchio di Reno; Emilio Martini, Pontecchio Marconi, and Domenico Lori, Ferrara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 407,277, Aug. 11, 1982, abandoned. This application Mar. 12, 1984, Ser. No. 588,775
Claims priority, application Italy, Aug. 14, 1981, 23519 A/81
Int. Cl.³ D21H *1/02*; B32B *21/06, 23/06*
U.S. Cl. 428—284 **13 Claims**

1. A process for bonding, by means of thermoadhesion, sheets or layers of cellulosic fibres, which comprises the following steps:

(1) preparing composite waterlaid sheets consisting of at least two layers, one consisting essentially of cellulosic fibres and the other, adjacent to the first one, formed by fibres of a thermoplastic synthetic polymer, or of blends of such fibres with up to 95% by weight of cellulosic fibres;

(2) superimposing two of such sheets on the side of the essentially cellulosic fibre layer, with inserted between them a film of at least a thermoplastic polymer having the following characteristics:

(a) a melting temperature lower than the melting temperature of the polymer constituting the thermoplastic synthetic fibres contained in the layer adjacent to the one consisting of cellulosic fibres;

(b) a viscosity in the molten state, measured in a capillary viscosimeter, at a velocity gradient lower than or equal to 10^{-1} seconds and at a temperature comprised between a temperature higher by 10° C. than the melting temperature of such thermoplastic polymer and a temperature higher by 20° C. than the melting temperature of the polymer forming such thermoplastic synthetic fibres, lower than 1.10^8 poises;

(c) a surface tension not exceeding by more than 5 dynes/cm the one of the polymer constituting such thermoplastic synthetic fibres, measured at the same temperature;

(d) a solubility parameter which is in a ratio to the solubility parameter of the thermoplastic polymer constituting such synthetic fibres ranging from 0.85 to 1.15, extremes included, at a temperature of 25° C.;

(3) heating the aggregate of the so superimposed sheets and film at a temperature ranging from a temperature exceeding by 10° C. the melting temperature of the polymer forming the film to a temperature exceeding by 20° C. the melting temperature of the polymer forming such thermoplastic fibres;

(4) compressing the aggregate at a temperature within such range.

13. Bonded articles obtained by the process according to claim 1.

4,500,595

STAINLESS STEEL FIBER-THERMOSPLASTIC GRANULES AND MOLDED ARTICLES THEREFROM

Steven R. Gerteisen; Richard M. Wenger, and Glenn M. Cannavo, all of Evansville, Ind., assignors to Plastic Specialties and Technologies, Inc., Barrington, Ill.

Filed Jul. 22, 1982, Ser. No. 400,779
Int. Cl.³ B32B *5/06*
U.S. Cl. 428—294 **11 Claims**

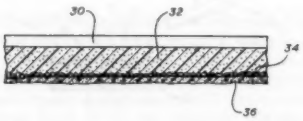
1. A thermoplastic resin elongated granule providing improved electromagnetic interference shielding properties comprising a thermoplastic resin elongated granule having incorporated therein a fiber constituent comprised of continuous strands of stainless steel fibers, said fibers extending substantially parallel to each other and substantially parallel to a length of the elongated granule.

4,500,596

POLYURETHANE FOAMED IN-SITU AGAINST SKIN TERPOLYMER COMPRISING ETHYLENE AND PROPYLENE

Jimmy D. Lee, 14914 Sellers Rd., Houston, Tex. 77060

Filed Jul. 18, 1983, Ser. No. 514,646
Int. Cl.³ B32B *27/40*
U.S. Cl. 428—317.5 **7 Claims**



1. A laminate composition produced by the process of (a) dispensing a continuous sheet of polymeric material comprising a terpolymer of ethylene and propylene as the principal monomers and a monomer of 1,4-hexadiene, norbornene, dicyclopentadiene or 1,5-cyclooctadiene, which is spaced away

from and substantially parallel to a substrate, said substrate being part of a building structure and (b) dispensing a foamable polyurethane into the enclosure formed by said substrate and said continuous polymeric material whereby said polyurethane foams to fill said enclosure, contacting and bonding to said substrate and said continuous polymeric material to form a monolithic structure.

4,500,597

COMPOSITE HEAT-INSULATING MATERIAL AND PROCESS FOR THE PRODUCTION THEREOF

Takao Yazaki; Kazuhide Hattori; Satoru Hattori; Kazuhide Hayama, and Isao Itoh, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd. and Mitsubishi Yuka Fine Chemicals Co., Ltd., both of Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,842

Claims priority, application Japan, Jul. 26, 1983, 58-136344; Nov. 2, 1983, 58-206807

Int. Cl.³ B32B *27/34, 3/26*

U.S. Cl. 428—317.7 **6 Claims**

1. A composite heat-insulating material of the structure that an olefin- or styrene-based resin sheet and a urethane foam are laminated on each other with an adhesive containing:

(A) 20 to 100% by weight of a water-soluble polyimine compound selected from the group consisting of polyethyleneimine, poly(ethyleneimine-urea), and a polyaminepolyamide/ethyleneimine adduct; and

(b) 80 to 0% by weight of a nitrogen atom-containing cationic or amphoteric polymer.

4,500,598

DRAFTING FILM

Klaus Thoese, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 18, 1983, Ser. No. 467,907

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207122

Int. Cl.³ B32B *27/08, 27/36*

U.S. Cl. 428—331 **17 Claims**

1. A drafting film, comprising

a plastic base;

an adhesive layer applied to a least one side of said plastic base; and

a pigmented coating system including a top layer and a pigmented layer applied to said adhesive layer, said top layer comprising:

a first component selected from the group consisting of a homopolymer or copolymer of vinyl acetate;

a second component selected from the group consisting of an acrylate or methacrylate copolymer comprising at least about 50% by weight of an ester monomer having at least four carbon atoms in the alcohol component thereof; and

an antistatic agent comprising a salt of a polymeric sulfonic acid, and

said pigmented layer comprising:

a delusterant, and

a pigmented material, whereby said drafting film can be written on with pencil and with aqueous ink.

4,500,599

MAGNETIC RECORDING MEDIUM

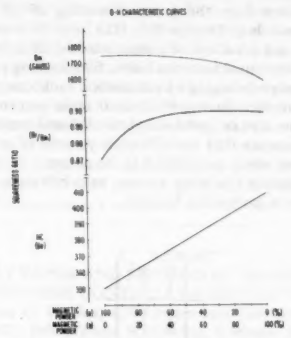
Hiroshi Ogawa; Chiaki Mizuno; Kouichi Masaki; Masaaki Suzuki, and Yasuo Tamai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 384,121, Jun. 1, 1982, abandoned. This application May 23, 1984, Ser. No. 613,748

Claims priority, application Japan, May 29, 1981, 56-82160

Int. Cl.³ G11B *5/70*; B32B *5/16*

U.S. Cl. 428—336 **3 Claims**



1. A magnetic recording medium comprising a non-magnetic base having formed thereon a single magnetic layer containing a fine particulate ferromagnetic material dispersed in a binder, said ferromagnetic material being a mixture of two fine ferromagnetic material being a mixture of two fine ferromagnetic powders (a) and (b) in a weight ratio of from 90/10 to 30/70, powder (a) consisting essentially of γ-Fe_2O_3 particles having a coercivity (Hc) of 330 to 390 Oe and a saturation magnetization (σs) of 68 to 80 emu/g at a maximum magnetizing force (Hm) of 5 KOe, and a specific surface area of 18 to 25 m^2/g, and powder (b) consisting essentially of γ-Fe_2O_3 particles having a coercivity (Hc) of 400 to 450 Oe and a saturation magnetization (σs) of 65 to 78 emu/g at a maximum magnetizing force (Hm) of 5 KOe, and a specific surface area of 22 to 30 m^2/g, wherein the magnetic layer is from 2.5 to 8 μm thick.

4,500,600

SIZE COMPOSITION FOR GLASS FIBERS

Robert Wong; Martin C. Flautt, both of Granville, and Richard M. Haines, Warsaw, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 790,786, Apr. 25, 1977, abandoned. This application Jan. 8, 1979, Ser. No. 1,793

Int. Cl.³ B32B *9/00*

U.S. Cl. 428—391 **11 Claims**

1. A glass fiber at least a portion of the surface of which is in contact with a residue produced by removing water from an aqueous composition comprising gamma-aminopropyltriethoxysilane and another alkoxysilane selected from methyltrimethoxysilane, phenyltrimethoxysilane, methylphenyldimethoxysilane and diphenyldimethoxysilane.

6. An aqueous size composition for glass fibers comprising gamma-aminopropyltriethoxysilane and another alkoxysilane selected from methyltrimethoxysilane, phenyltrimethoxysilane, methylphenyldimethoxysilane and diphenyldimethoxysilane.

9. A method for producing glass fiber reinforced plastics which comprises coating glass fibers with an aqueous composition comprising gamma-aminopropyltriethoxysilane and another alkoxysilane selected from methyltrimethoxysilane, phenyltrimethoxysilane, methylphenyldimethoxysilane and diphenyldimethoxysilane, and incorporating the resulting coated fibers into an organic polymer matrix.

4,500,601
CHELATING POLYMERS FOR MODIFYING METAL SURFACE PROPERTIES

David R. Whitcomb, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 29, 1983, Ser. No. 527,332
Int. Cl.³ B32B *15/08, 27/14*
U.S. Cl. 428—403 13 Claims

1. A composite structure comprising a metal surface of polyvalent metal atoms and ions, said metal surface comprising a metal chosen from the group consisting of (a) transition metals, (b) metals of Groups IIA, IIIA, and IVA of the Periodic Table, and (c) alloys of metals selected from (a) and (b), and applied thereto at least one linear, film-forming polymer or random copolymer having a hydrocarbon backbone, said polymer or copolymer having 99.99 to 0 mole percent of units derived from one or more ethylenically-unsaturated monomers, and between 0.01 and 100 mole percent of at least one monomer unit which contributes to the polymer or copolymer pendent bidentate chelating groups, said bidentate chelating monomer units having the formula

in which

R^1 is hydrogen, lower alkyl (1 to 4 carbon atoms), chlorinated lower alkyl, CN, or Cl

P is a connecting linkage of chain length up to about 75 atoms, and providing that P does not react with Q, nor enter into any chelating action with Q, nor has polymerizing units within it, and

Q is a bidentate chelating moiety chosen from groups having a high affinity for the polyvalent metal ion defined above, and the solvating ability of the bidentate group for the metal surface is given by the expression

$\log K_1 + n(14 - pH) - (pKs + pKa)$ is algebraically less than 0.0, wherein

K_1 is the first stepwise stability constant of the chelate and metal,

n is the relevant valency of the metal,

pH is the acidity relevant under the conditions of test,

pKs is the solubility product of the metal hydroxide, and

pKa is the stability constant of H^+ with the chelate moiety.

5. The composite structure according to claim 1 wherein said metal surface is selected from (a) the surface on a self-supporting metal, (b) a thin metal layer on a support, and (c) small particles of metal.

4,500,602
COMPOSITE PROTECTIVE COATING FOR CARBON-CARBON SUBSTRATES

James W. Patten; Ronald W. Moss, both of Richland, Wash., and Brennan A. Forcht, Arlington, Tex., assignors to LTV Aerospace and Defense Co., Dallas, Tex.

Filed Aug. 10, 1981, Ser. No. 291,729
Int. Cl.³ B32B *9/00*
U.S. Cl. 428—408 12 Claims

1. A composite protective coating for preventing carbonaceous substrates from degrading in oxygen containing environments comprising:

(a) a first coating layer applied to the surface of the substrate comprising a silicon carbide type coating; and

(b) a second coating layer applied to the surface of said first coating layer, said second coating layer comprising a sputter deposited, phase stabilized zirconium oxide having a columnar microstructure.

4,500,603
ELECTRICAL GRADE EXTRUDED FILLED THERMOPLASTIC SHEET MATERIAL AND PROCESS FOR THE MANUFACTURE THEREOF

Richard A. Freundlich, Summit, N.J., assignor to Celanese Corporation, N.Y.

Continuation of Ser. No. 63,003, Aug. 2, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,918
Int. Cl.³ B32B *17/04, 5/08*
U.S. Cl. 428—409 15 Claims

1. An extruded, filled thermoplastic sheet material, comprising a crystalline thermoplastic polymer selected from the group consisting of polyolefins; polyoxymethylene homopolymers and copolymers; polyphenylene oxide polymers; polyamides; polyesters; mixtures thereof; and mixtures thereof with minor amounts of other thermoplastic polymers; containing from about 5 to 60 percent by weight of a reinforcing filler material, the reinforcing filler consisting essentially of fibrous materials, and having a polymer-rich surface which is substantially free of exposed reinforcing filler material and comprises substantially a layer of non-filled thermoplastic polymer; said surface having a gloss value of at least about 15, and a maximum surface roughness of about 150 microinches.

8. An extruded, glass-filled polyalkylene terephthalate continuous sheet material comprising a polyalkylene terephthalate polymer, mixtures of polyalkylene terephthalate polymers; and mixtures of polyalkylene terephthalate polymers; with minor amounts of other thermoplastic polymers; from about 5 to 60 percent by weight of glass fibers; essentially no particulate reinforcing material; and having a surface which is substantially free of exposed reinforcing filler material and comprises substantially a layer of non-filled thermoplastic polymer; said surface having a gloss value of at least 15, and a maximum roughness of about 150 microinches.

4,500,604
BONDINGS AND COMPOSITE FILMS

Julius Herold, Monheim; Werner Gruber, Korschenbroich, and Guenter Henke, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 16, 1983, Ser. No. 466,996
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205733
Int. Cl.³ B32B *27/38*; C08L *63/00, 75/00*; C09J *5/00*
U.S. Cl. 428—414 20 Claims

1. A two component adhesive system wherein the components are maintained separately prior to mixing the components together to achieve bonding consisting essentially of:

(a) about 0.9 to about 2.5 equivalents of a first component which is a prepolymer containing an epoxy group wherein the prepolymer is the reaction product of (i) a polyether urethane or a polyester urethane, said urethane having at least two terminal isocyanate groups, and (ii) an equivalent quantity of glycidol; and

(b) 1.0 equivalent of a second component which is at least one member of the group consisting of a polyether containing at least two terminal primary amino groups and a

polyamide containing at least two terminal primary amino groups, and wherein said polyether and polyamide have a number-average molecular weight in the range of from about 200 to about 1800.

4. A process for bonding at least one material together comprising applying thereto a two component adhesive system which consists essentially of:

(a) about 0.9 to about 2.5 equivalents of a first component which is a prepolymer containing an epoxy group wherein the prepolymer is the reaction product of (i) a polyether urethane or a polyester urethane, said urethane having at least two terminal isocyanate groups, and (ii) an equivalent quantity of glycidol; and

(b) 1.0 equivalent of a second component which is at least one member of the group consisting of a polyether containing at least two terminal primary amino groups and a polyamide containing at least two terminal primary amino groups, and wherein said polyether and polyamide have a number-average molecular weight in the range of from about 200 to about 1800.

13. A composite film bonded together with a two component adhesive system consisting essentially of:

(a) about 0.9 to about 2.5 equivalents of a first component which is a prepolymer containing an epoxy group wherein the prepolymer is the reaction product of (i) a polyether urethane or a polyester urethane, said urethane having at least two terminal isocyanate groups, and (ii) an equivalent quantity of glycidol; and

(b) 1.0 equivalent of a second component which is at least one member of the group consisting of a polyether containing at least two terminal primary amino groups and a polyamide containing at least two terminal primary amino groups, and wherein said polyether and polyamide have a number-average molecular weight in the range of from about 200 to about 1800.

17. A composite film in accordance with claim **13** wherein the composite film contains at least two films selected from the group consisting of a plastic film, a metal foil, a viscose, paper, a fleece composed of an aromatic polyamide, and a fleece composed of an aromatic polyester.

4,500,605

ELECTRICAL COMPONENT FORMING PROCESS

Julius C. Fister, Hamden, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 17, 1983, Ser. No. 467,616
Int. Cl.³ C23C *11/00, 11/10*
U.S. Cl. 428—469 **15 Claims**

1. The process of forming a composite, comprising the steps of:

(a) providing an alloy comprising a first alloy component of about 0.5 to 12% aluminum and the balance being selected from a material from the group consisting of copper, iron or nickel;

(b) heating said alloy at a temperature below about 350° C. in an oxygen-rich atmosphere to form an oxide layer of said material on a surface of said alloy; and

(c) heating said alloy at a temperature between approximately 500° to 850° C. in a reducing atmosphere to reduce said oxide layer of said material into a layer of said material and to simultaneously form an aluminum oxide layer between said layer of said material and the surface of said alloy.

11. An article of manufacture formed by the process of claim **10**.

4,500,606

SEALER FOR POLYESTER AND METHOD OF USE TO OBTAIN LAMINATES

Thomas G. Rabito, Ashland; Stephen M. Oswalt, Mansfield, and Richard L. Cline, Ashland, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 16, 1983, Ser. No. 552,635
Int. Cl.³ B32B *9/04*
U.S. Cl. 428—480 **2 Claims**

1. A polyester composition laminate having an improved bond between the adhesive, which is one selected from the class consisting of isocyanate, epoxy and acrylic due to the surface of the polyester composition having a seal coat against evolution of gases at 190° C. for one hour, said seal coat comprising a coat of a sealer comprising a mixture of 100 to 1000 parts of a phenol-formaldehyde resin, 90 to 110 parts of a flexibilizer film former selected from the class of resins consisting of polyvinyl acetal, polyvinyl chloride, polyvinyl alcohol, saturated polyesters, polyacrylates, polyvinyl acetates and butyrals and 10 to 40 parts of epoxy resins which were dried at least 10 minutes at a temperature of at least 120° C.

4,500,607

FLAT PAPER AND METHOD OF MANUFACTURING INVOLVING CONTROLLED DRYING CONDITIONS

William G. Louden, c/o Louden and Company, Erwinna, Pa. 18920, and William S. Louden, Erwinna, Pa., assignors to William Gordon Louden, Erwinna, Pa.

Filed Jul. 28, 1982, Ser. No. 402,750
Int. Cl.³ B05D *3/02;* **D21H** *1/40, 1/48*
U.S. Cl. 428—511 **30 Claims**

1. A paper manufactured in a continuous process on a conventional paper making machine having a downstream dryer section, said paper, comprising: a web of cellulosic fibers and a polymeric material carried by the web, said paper comprising not less than about 3%, by weight, of said polymeric material, said weight being based on the finished dry weight of the paper, said finished paper having been dried in said dryer section to a moisture content in a range of 1% to about 4%, by weight, based on the finished weight of said paper.

19. A method of manufacturing paper on a conventional paper making machine having a downstream dryer section, comprising the steps of:

forming a web of cellulosic fibers,

advancing said web in said machine,

applying to both sides of said web as it advances an aqueous dispersion including a polymeric material in an amount sufficient to constitute atleast about 3%, by weight, of the dry weight of the finished paper, and

drying said advancing web in said downstream dryer section to a moisture level in a range of 1% to about 4%, by weight, based on the dry weight of the finished paper,

whereby the finished paper is characterized by a flatness which tends to remain even after the paper has been subjected to moisture and redried.

4,500,608

ANAEROBICALLY-CURING COMPOSITIONS

Anthony J. Rametta, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 289,703, Aug. 3, 1981, Pat. No. 4,447,588, which is a continuation-in-part of Ser. No. 203,682, Nov. 3, 1980, abandoned. This application Dec. 9, 1983, Ser. No. 559,953
Int. Cl.³ B32B *27/30*
U.S. Cl. 428—522 **33 Claims**

1. A method for bonding air-impermeable substrates using an adhesive composition which is cured anaerobically, said method comprising the steps of:

(a) applying said adhesive composition to at least one substrate to be bonded;

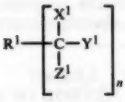
(b) bringing the substrates into abutting relation in a manner

to provide an anaerobically-curable environment for said adhesive composition; and

(c) maintaining said substrates in said abutting relation until said adhesive composition polymerizes and bonds said substrates together; wherein said adhesive composition comprises:

(1) a polymerizable monomer having at least one α,β-unsaturated carboxyl functionality per molecule of monomer;

(2) an effective amount of a halogen-containing compound as a first initiator component and selected from the group consisting of compounds of the formula



wherein:

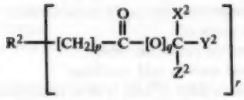
X^1 is selected from the group consisting of H, CH_3, Cl, and Br;

Y^1 and Z^1 are each selected independently from the group consisting of Cl and Br;

R^1 is selected from the group consisting of aromatic and heteroaromatic residues; and

n is an integer from 1 to 3 inclusive;

and compounds of the formula



wherein:

X^2 is selected from the group consisting of H, Cl, Br and CN;

Y^2 and Z^2 are each selected independently from the group consisting of Cl and Br;

R^2 is selected from the group consisting of amino residues and organic radicals comprising 1 to about 10 carbons;

p is 0 or 1;

q is 0 or 1; and

r is 1 or 2;

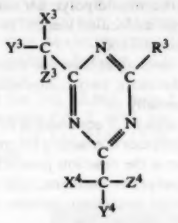
(3) an effective amount of a second initiator component selected from compounds of the group consisting of secondary amines, tertiary amines, organic sulfimides, and perfluoroalkyl sulfonanilides;

(4) a sufficient amount of an inhibitor of free-radical polymerization to retard polymerization of said composition while in the presence of air.

19. An anearobically-curing composition, comprising:

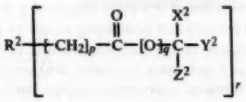
(A) a polymerizable monomer having at least one α, β-unsaturated carboxyl functionality per molecular of monomer;

(B) an effective amount of a halogen-containing compound as a first initiator component and selected from the group consisting of halogenated triazines of the formula



wherein:

X^3 and X^4 are each selected independently from the group consisting of H, CH_3, Cl, and Br; Y^3, Y^4, Z^3 and Z^4 are each independently selected from the group consisting of Cl and Br; and R^3 is selected from the group consisting of H and organic radicals comprising 1 to about 10 carbons; and compounds of the formula



wherein:

X^2 is selected from the group consisting of H, Cl, Br and CN;

Y^2 and Z^2 are each selected independently from the group consisting of Cl and Br;

R^2 is selected from the group consisting of amino residues and organic radicals comprising 1 to about 10 carbons;

p is 0 or 1;

q is 0 or 1; and

r is 0 or 2;

(C) an effective amount of a second initiator component selected from organic sulfimides, perfluoroalkyl sulfonanilides, secondary amines of the formula

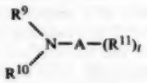
wherein:

R^4 and R^5 are each hydrocarbon groups comprising 1 to about 12 carbons, tertiary amines of the formula

wherein:

R^6, R^7 and R^8 are each hydrocarbon groups comprising 1 to about 12 carbons;

and tertiary amines of the formula



wherein:

R^9 and R^{10} are each hydrocarbon groups comprising up to about 12 carbons;

A is a carbocyclic aromatic nucleus selected from the group consisting of phenyl and naphthyl radicals;

R^{11} is an organic radical group comprising up to about 5 carbons and is selected from the group consisting of alkyl and alkoxy radicals; and t is from 0 to 3 inclusive;

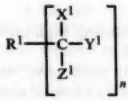
(D) a sufficient amount of an inhibitor of free-radical polymerization of retard polymerization of said adhesive composition while in the presence of air, and

(E) a modifying polymer.

32. An anaerobically-curing composition comprising:

(A) a polymerizable monomer having at least one α, β-unsaturated carboxyl functionality per molecule of monomer;

(B) an effective amount of a halogen-containing compound as a first initiator component and selected from compounds of the formula



wherein:

X^1 is selected from the group consisting of H, CH_3, Cl, and Br;

Y^1 and Z^1 are each selected independently from the group consisting of Cl and Br;

R^1 is selected from the group consisting of aromatic and heteroaromatic residues; and

n is an integer from 1 to 3 inclusive;

(C) an effective amount of a second initiator component selected from compounds of the group consisting of organic sulfimides and perfluoroalkyl sulfonanilides;

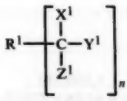
(D) a sufficient amount of an inhibitor of free-radical polymerization to retard polymerization of said composition while in the presence of air; and

(E) a modifying polymer.

33. A bonded article comprising two air-impermeable substrates, said substrates being bonded together using an adhesive composition which has been cured anaerobically, said adhesive composition comprising:

(A) a polymerizable monomer having at least one α, β-unsaturated carboxyl functionality per molecule of monomer;

(B) an effective amount of a halogen-containing compound as a first initiator component and selected from the group consisting of compounds of the formula



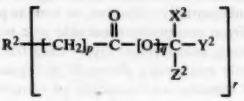
wherein:

X^1 is selected from the group consisting of H, CH_3, Cl, and Br;

Y^1 and Z^1 are each selected independently from the group consisting of Cl and Br;

R^1 is selected from the group consisting of aromatic and heteroaromatic residues; and n is an integer from 1 to 3 inclusive;

and compounds formula



wherein:

X^2 is selected from the group consisting of H, Cl, Br and CN;

Y^2 and Z^2 are each selected independently from the group consisting of Cl and Br;

R^2 is selected from the group consisting of amino residues and organic radicals comprising 1 to about 10 carbons;

p is 0 or 1;

q is 0 or 1; and

r is 1 or 2;

(C) an effective amount of a second initiator component selected from compounds of the group consisting of secondary amines, tertiary amines, organic sulfimides, and perfluoroalkyl sulfonanilides;

(D) a sufficient amount of an inhibitor of free-radical polymerization to retard polymerization of said adhesive composition while in the present of air.

4,500,609

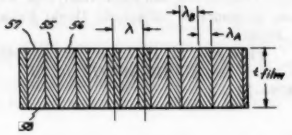
THIN FILM BINARY METALLIC EUTECTICS

Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 20, 1981, Ser. No. 245,764

Int. Cl.³ B32B *5/14, 15/00*

U.S. Cl. 428—610 **14 Claims**



1. A fault-free and cell-free thin film of a binary metallic eutectic having an aligned lamellar periodic geometric array of a first type lamella and a second type lamella located between lamellae of said first type, the composition of said first and second type lamellae corresponding substantially to the terminal solid solutions of the binary metallic eutectic, said lamellae extending between and terminating in top and bottom substantially parallel and generally planar major opposed surfaces of said thin film and being substantially perpendicular to the planes of said top and bottom major surfaces, the perpendicular distance between said major opposed surfaces being the thickness of said film, the distance from the centerline of one lamella to the next closest lamella of the same type in said array being the interlamellar spacing, said thickness being less than or equal to about 8 microns, and said interlamellar spacing being less than or equal to about 1 micron.

4,500,610

CORROSION RESISTANT SUBSTRATE WITH METALLIC UNDERCOAT AND CHROMIUM TOPCOAT

Walter H. Gunn, 45 Virginia Dr., Painesville, Ohio 44077, and Alexander W. Kennedy, 11857 Auburn Rd., Chardon, Ohio 44024

Filed Mar. 16, 1983, Ser. No. 475,734

Int. Cl.³ C25D *5/10*

U.S. Cl. 428—624 **33 Claims**

1. A coated metal substrate having enhanced corrosion resistance and protected by a coating composite comprising a thin metallic undercoating layer of combined metals in metallic

form at least one of which is selected from the group consisting of zinc, nickel, iron, chromium, aluminum and cobalt, and a heat-curable, substantially resin free, as well as phosphate free, topcoat layer from composition curable to a water resistance protective coating, said topcoat layer being free from particulate metals while containing above 10 milligrams per square foot of coated metallic undercoating of chromium, as chromium, in non-elemental form, said composition containing hexavalent-chromium-providing-substance in liquid medium.

4,500,611

SOLDERABLE LAYER SYSTEM

Friedrich W. Nickol, and Holm Baeger, both of Schwalbach, Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 22, 1981, Ser. No. 286,102

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1980, 3028044

Int. Cl.³ C23C *17/00*

U.S. Cl. 428—686 **11 Claims**

1. In a corrosion-resistant solderable layer system, produced in a manufacturing stage of a transparent display device, said corrosion-resistant solderable layer system being connected at least indirectly to an unsolderable layer, the layer system and the unsolderable layer being applied to a support, and the layer system comprises a solderable layer and an anti-corrosion layer which covers the solderable layer and protects the latter against oxidation, the improvement in the layer system wherein

the anti-corrosion layer is made of an oxidizable metal.

4,500,612

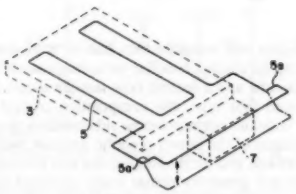
TEMPERATURE CONTROL DEVICE FOR A FUEL CELL

Masao Fujii, Takarazuka, and Enju Nishiyama, Kawanishi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,548

Int. Cl.³ H01M *8/12, 10/50*

U.S. Cl. 429—26 **2 Claims**



1. A temperature control device for a fuel cell, comprising:

a pair of confronting temperature control plates having reaction gas conduit means on surfaces opposite to the confronting surfaces thereof;

circulation piping adapted for circulation therein of sealed-in liquid heat medium in the inside space thereof, with a portion of said space being left for a gaseous phase of the heat medium, said circulation piping including heat exchanger piping positioned between said temperature control plates, and including outside piping located externally of said temperature control plates hermetically connected to said heat exchanger piping to form a closed piping system therewith; and

heat exchanger means, provided in said outside piping, for effecting heat exchange with the heat medium in said circulation pipe; said outside piping including shiftable connection piping interposed between said heat exchanger piping and said heat exchanger means for vertically shifting said heat exchanger means with respect to said heat exchanger piping.

4,500,613

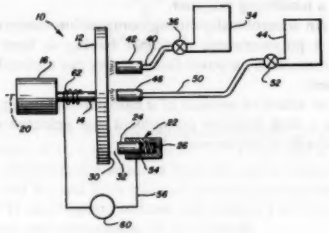
ELECTROCHEMICAL CELL AND METHOD

Andrew D. Galbraith, Los Altos, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Mar. 14, 1984, Ser. No. 589,308

Int. Cl.³ H01M *2/38*

U.S. Cl. 429—69 **15 Claims**



13. A method of producing high current electrical energy comprising the steps of:

moving an electrically conductive, electrochemically non-reactive low resistance cathode surface transversely to a lithium anode;

spacing said anode from said cathode surface to form a thin electrochemical junction between said anode and said cathode surface;

introducing to said electrochemical junction an aqueous electrolyte reactive with lithium;

introducing to said electrochemical junction an acid oxidizing agent capable of dissolving the products of the reaction between lithium and said electrolyte; and

drawing electrical current in an external electrical circuit connecting said anode and said cathode.

14. In a rotating cathode cell having means for moving the surface of an electrically conductive, electrochemically non-reactive low resistance cathode transversely to an alkali metal anode, means for spacing said anode from said cathode surface to form a thin electrochemical junction between said anode and said cathode surface, means for introducing to said electrochemical junction an aqueous electrolyte reactive with said alkali metal, and an external electrical circuit connecting said anode and said cathode, the improvement wherein said alkali metal is lithium and said cell includes means for introducing to said electrochemical junction an acid oxidizing agent capable of dissolving the products of the reaction between lithium and said electrolyte.

4,500,614

ALKALINE CELL

Akio Nagamine; Akira Hayashi, both of Tokyo; Kazumasa Yoshida, Samukawa, and Kojiro Miyasaka, Tokyo, all of Japan, assignors to Toshiba Battery Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 499,884

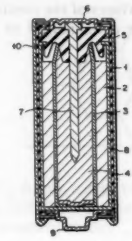
Claims priority, application Japan, Jun. 11, 1982, 57-100154; Jun. 11, 1982, 57-100155

Int. Cl.³ H01M *6/04*

U.S. Cl. 429—206 **3 Claims**

1. An alkaline cell comprising an anode prepared by forming on the particles of a zinc powder an alloy layer made of mer-

cury and at least two metals selected from the group consisting of gallium, indium and thallium, wherein an amount of mercury is 0.05 to 1.80% by weight based on a weight of the zinc powder.



4,500,615

WAFER EXPOSURE METHOD AND APPARATUS

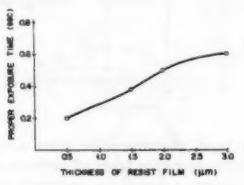
Hiroshi Iwai, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 22, 1982, Ser. No. 421,070

Claims priority, application Japan, Sep. 22, 1981, 56-149866

Int. Cl.³ G03C *5/00*; G01B *11/02*

U.S. Cl. 430—30 **12 Claims**



1. A wafer exposure method comprising the steps of:

measuring the thicknesses of a portion of a resist film for each of a plurality of separate and discrete chip forming regions of a wafer;

exposing said resist film covering said wafer by a step and repeat method to transfer a pattern to each of the chip forming regions; and

controlling the exposure of said chip forming regions on the basis of the measured thickness of said resist film of the chip forming region being exposed during transfer of said pattern.

4,500,616

EXTRACTION DEVELOPING METHOD FOR ELECTROSTATIC LATENT IMAGES

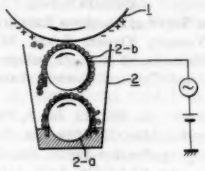
Satoshi Haneda; Masahiko Itaya, and Minoru Tanaka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1982, Ser. No. 419,940

Int. Cl.³ G03G *13/08, 13/09*

U.S. Cl. 430—45 **18 Claims**

1. A method of develping an electrostatic latent image on a charge receptor, said image having a first charge, comprising selectively extracting, in the presence of an alternating field, first colored grains having a second charge of polarity opposite that of sid first charge from a mixture of colored grains of different polarities, and thereafter developing said latent image with said extracted colored grains.



4,500,617

METHOD FOR PREPARING A LITHOGRAPHIC PRINTING PLATE AND A LIGHT-SENSITIVE MATERIAL USED THEREFOR

Takao Nakayama, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 3, 1983, Ser. No. 471,605

Claims priority, application Japan, Mar. 3, 1982, 57-32214; Mar. 31, 1982, 57-51064

Int. Cl.³ G03G *13/26*

U.S. Cl. 430—49 **10 Claims**

1. In a method for preparing a lithographic printing plate using a light-sensitive material comprising an aluminum or aluminum alloy support having a hydrophilic aluminum oxide surface provided thereon, in order, a light-sensitive layer and a photoconductive insulating layer, said method comprising the steps of:

electrophotographically forming an electrostatic latent image on the photoconductive insulating layer;

developing the latent image with toners which are opaque to the light to which the light-sensitive layer is sensitive, thereby forming toner image;

exposing the light-sensitive layer through the toner image; and

separating the exposed and unexposed areas of the light-sensitive layer;

wherein said aluminum oxide layer is present in an average amount of from 0.2 to 2.8 g/m^2.

4,500,618

ELECTROPHOTOGRAPHIC PROCESS FOR PRODUCING PRINTING PLATE AND PLATE MAKING MACHINE

Keisuke Shiba, Shizuoka; Hiromi Yazawa, Kanagawa; Chikashi Ohishi, and Sho Nakao, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 28, 1983, Ser. No. 508,754

Claims priority, application Japan, Jun. 30, 1982, 57-112759

Int. Cl.³ G03G *13/26*

U.S. Cl. 430—49 **8 Claims**

1. A process for producing a printing plate, comprising the steps of:

providing an electrophotographic plate making material comprised of a base having a photoconductive layer thereon;

electrically charging the plate making material;

imagewise exposing the material;

subjecting the material to liquid toner development in a toner containing a solvent;

substantially removing the solvent by heating to a temperature sufficient to cause evaporation of the solvent;

moving the material to a fixation area; and

fixing a toner image on the plate making material by heating the material to a temperature higher than the temperature sufficient to cause evaporation of the solvent.

4,500,619
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER WITH OXADIAZOLE CONTAINING DISAZO COMPOUND

Shozo Ishikawa, Sayama; Kazuharu Katagiri, Mitaka; Katsunori Watanabe, Yamato; Kiyoshi Sakai, Mitaka, and Makoto Kitahara, Yokohama, all of Japan, assignors to Copyer Kabushiki Kaisha and Canon Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 395,323, Jul. 6, 1982, abandoned. This application Mar. 22, 1984, Ser. No. 591,909

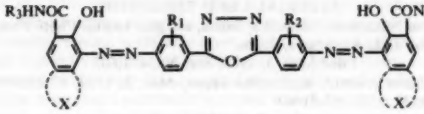
Claims priority, application Japan, Jul. 22, 1981, 56-113563

Int. Cl.³ G03G *5/06, 5/14*

U.S. Cl. 430—59 **11 Claims**

1. An electrophotographic photosensitive member having a conductive support and a layer containing a charge transport material and a layer containing at least one disazo pigment represented by the following Formula (I):

(I)



wherein each of R_1 and R_2 is selected from the group consisting of hydrogen, halogen, lower alkyl, or lower alkoxy; R_3 is selected from the group consisting of methyl, ethyl or C_3–C_{10} linear alkyl; and X is selected from the group of residues necessary to complete an aromatic hydrocarbon ring or heterocyclic ring, substituted or unsubstituted.

4,500,620
ELECTROPHOTOGRAPHIC ELEMENT WITH COPOLYMER INTERLAYER

Chikashi Ohishi, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 14, 1983, Ser. No. 513,587

Claims priority, application Japan, Jul. 14, 1982, 57-121279

Int. Cl.³ G03G *5/14*

U.S. Cl. 430—60 **7 Claims**

1. An electrophotographic light-sensitive material, comprising:

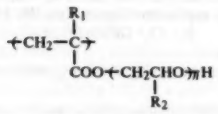
a support base having a conductive surface, having formed thereon;

an interlayer; and

a photoconductive layer formed on the interlayer;

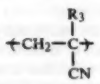
said interlayer comprising a polymer having constitutional units represented by the following formulae I and II and having an acid value of 10 to 100 as the main component:

I



wherein R_1 is a hydrogen atom or a methyl group; R_2 is a hydrogen atom, a methyl group, an ethyl group, or a chloromethyl group; and n is an integer of 1 to 10

II



wherein R_3 is a hydrogen atom or a methyl group, wherein the polymer includes constitutional unit II in an amount in the range of 5 to 60% by weight and the constitutional unit I in an amount in the range of 30 to 80% by weight, wherein the interlayer is present in an amount in the range of 0.1 g/m² to 10 g/m² and wherein both surfaces of the conductive support are laminated by polyethylene containing 5 to 25% carbon at a thickness of 10 to 45 μm.

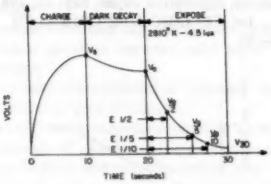
4,500,621
SENSITIVE ELECTROPHOTOGRAPHIC PLATES CONTAINING SQUARIC ACID METHINE DYES SUSPENDED IN A BINDER

Herbert K. Wurster, Los Gatos, Calif., assignor to Ricoh Systems, Inc., San Jose, Calif.

Filed Apr. 11, 1983, Ser. No. 483,888

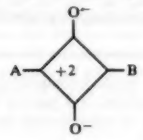
Int. Cl.³ G03G *5/06*

U.S. Cl. 430—72 **8 Claims**

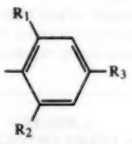


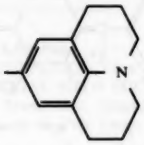
1. A single layer photoreceptor plate comprising a solid continuous photoconductor layer of uniform thickness in the range of 1–60 microns consisting essentially of a noncharge-transporting binder material and a charge-generating, charge-transporting squaric acid methine dye selected from the group consisting of compounds of the Formula I:

(I)

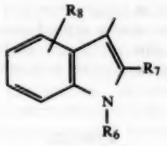


wherein A and B are independently,

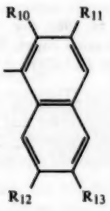




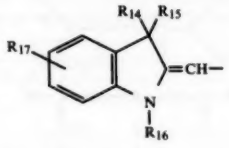
wherein R_1, R_2, R_3 are independently H, OH or alkyl of 1 to 6 carbon atoms, NR_4R_5, wherein R_4 and R_5 are independnetly alkyl of 1 to 6 carbon atoms;



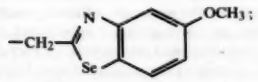
R_6 and R_7 are independently alkyl of 1 to 6 carbon atoms; and R_8 is independently H, OR_9 or halogen, wherein R_9 is alkyl of 1 to 6 carbon atoms;



wherein R_{10}, R_{11}, R_{12} and R_{13} are independently H, OH or alkyl of 1 to 6 carbon atoms;



wherein R_{14}, R_{15} and R_{16} are independently alkyl of 1 to 6 carbon atoms; and R_{17} is independently H, OR_{18} or halogen, wherein R_{18} is alkyl of 1 to 6 carbon atoms; or



wherein the proportion of said dye to said binder material in said photoconductor is in the range of 1:1 to 1:40.

4,500,622

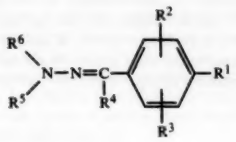
ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE PRINTING MATERIALS

Seiji Horie; Junji Nakano; Masayoshi Nagata, and Hideo Sato, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa

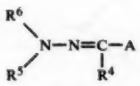
Filed Mar. 9, 1982, Ser. No. 356,541
Claims priority, application Japan, Mar. 9, 1981, 56-33579
Int. Cl.³ G03G *5/00, 5/14, 5/04, 5/06*
U.S. Cl. 430—78 **8 Claims**

1. An electrophotographic light-sensitive printing material comprising a conductive base plate having formed thereon an electrophotographic light-sensitive layer containing (a) a hydrazone compound, (b) at least one compound selected from a barbituric acid derivative, a thiobarbituric acid derivative, and other charge generating materials, and (c) a resin binder,

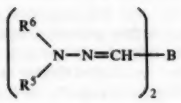
wherein said hydrazone compound is one member selected from the group consisting of the following general formulas (I), (II), (III), (IV), (V), and (VI):



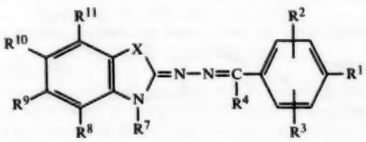
(I)



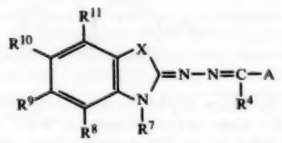
(II)



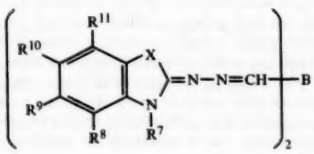
(III)



(IV)



(V)

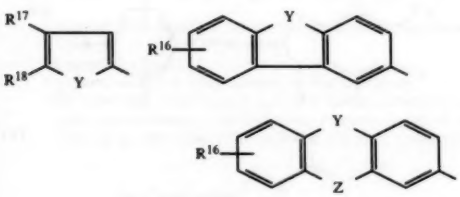


(VI)

wherein X represents an oxygen atom, a sulfur atom, a selenium atom, an unsubstituted or substituted imino group, or a methylene group; R^1 represents an alkoxy group, an aralkoxy group, or a substituted amino group shown by

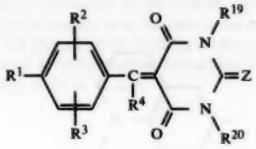
wherein R^{12} and R^{13}, which may be the same or different, each represents an unsubstituted or substituted alkyl or phenyl group or R^{12} and R^{13} may represent groups which are combined with each other to form a heterocyclic ring including nitrogen atom; R^2 and R^3, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, or a lower alkoxy group; R^4 represents a hydrogen atom, an alkyl group, an unsubstituted or substituted phenyl group; R^5 and R^6, which may be the same or different, each represents an unsubstituted or subtituted straight chain or branched alkyl group having 1 to 12 carbon atoms, an unsubstituted or substituted straight chain or branched aralkyl group having 7 to 20 carbon atoms, or a monovalent group, aryl group, formed by removing one hydrogen atom from an unsubstituted or substituted monocyclic or 2 to 4 cyclic condensed aromatic hydrocarbon, or R^5 and R^6 my form a carbazole ring; R^7 represents an unsubstituted or substituted alkyl group; R^8, R^9, R^{10}, and R^{11} which may be the same or different, each represents a hydrogen atom, a halogen atom, an unsubstituted or substituted alkyl group or phenyl group, an alkoxy group, an aralkoxy group, or an amino group shown by

wherein R^{14} and R^{15} represent a hydrogen atom or the same groups as shown by R^{12} and R^{13} described above, or may combine with each other to form a condensed carbon ring or a condensed heterocyclic ring; A represents a monocyclic or condensed heterocyclic 5-membered ring or condensed heterocyclic 6-membered ring shown by the following structural formula:

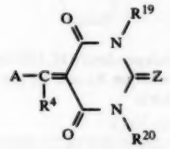


wherein Y and Z, which may be the same or different, each represents a sulfur atom, an oxygen atom, or N–$R^{17'}$ wherein $R^{17'}$ is an alkyl group having 1 to 4 carbon atoms, R^{16} represents a hydrogen atom, an alkyl group, an alkoxy group, an aryloxy group, an acyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a halogen atom, a monoalkylamino group, a dialkylamino group, an amido group or a nitro group, R^{17} and R^{18}, which may be the same or different, represent a hydrogen atom, an alkyl group or an alkoxy group, or may be groups which combine with each other to form a benzene ring or a naphthalene ring; and B represents an unsubstituted or substituted aryl group; and

wherein said barbituric acid derivative or thiobarbituric acid derivative is at least one member selected from the group consisting of the following general formulas (VII) and (VIII):



(VII)



(VIII)

wherein Z represents an oxygen atom or a sulfur atom; R^1, R^2, R^3, R^4 and A are the same as defined above; and R^{19} and R^{20}, which may be the same or different, each represents an alkyl group, an aralkyl group, or an unsubstituted or substituted phenyl group.

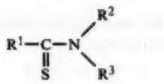
4,500,623

PHOTOCONDUCTIVE COMPOSITIONS COMPRISING AN ORGANIC PHOTOCONDUCTOR AND A THIOAMIDE COMPOUND AND ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS USING THE COMPOSITIONS

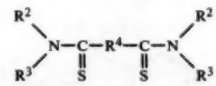
Kenji Sano; Syunichi Kondo, and Hideo Sato, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 14, 1982, Ser. No. 449,725
Claims priority, application Japan, Dec. 14, 1981, 56-201307
Int. Cl.³ G03C 5/04
U.S. Cl. 430—83 **8 Claims**

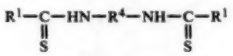
1. A photoconductive composition, comprising: in combination, an organic photoconductor and a thioamide compound for sensitizing the organic photoconductor, wherein said thioamide compound is a compound represented by following general formula I to III;



I



II



III

wherein R^1 represents an alkyl group, a substituted alkyl group, an alkoxy group, a substituted alkoxy group, a substituted or unsubstituted monocyclic or bicyclic condensed aryl group, a substituted or unsubstituted monocyclic or bicyclic condensed aryloxy group, or a monovalent group induced from a substituted or unsubstituted heterocyclic ring; said two R^1s in general formula III may be the same or different; R^2 and R^3, which may be the same or different, each represents a hydrogen atom, an alkyl group, a substituted alkyl group, a substituted or unsubstituted monocyclic or bicyclic condensed aryl group, or a monovalent group induced from a substituted or unsubstituted heterocyclic ring; and R^4 represents a methylene group, a polymethylene group, a branched alkanediyl group, or an arylene group; said R^1 and R^2 or said R^3 and R^3

in general formula I, R^2 and R^3, or R^2 or R^3 and R^4 in general formula II and R^1 and R^4 in general formula III may combine with each other.

4,500,624

HEAT-DEVELOPABLE DIFFUSION TRANSFER COLOR PHOTOGRAPHIC MATERIAL WITH MICROCAPSULES

Toshiaki Aono; Hiroshi Hara, and Hideki Naito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 7, 1983, Ser. No. 483,063
Claims priority, application Japan, Apr. 7, 1982, 57-57781
Int. Cl.³ G03C *5/54, 1/40*
U.S. Cl. 430—138 **64 Claims**

1. A heat-developable diffusion transfer color photographic material comprising a heat-developable color photographic element containing a light-sensitive silver halide, an organic silver salt oxidizing agent and a color image forming substance containing a color image forming dye which does not contain a group having a charge and an image receiving element capable of accepting a dye which is formed or released in the heat-developable color photographic element, the heat-developable color photographic element and the image receiving element being provided on a support having further provided thereon microcapsules comprised of a water-immiscible core material compound which is liquid at a temperature of not less than 120° C. and a water-insoluble polymer, wherein the color image forming substance is a compound containing a dye selected from the group consisting of an azo dye, an azomethine dye, an anthraquinone dye, a naphthoquinons dye, a nitro dye, a styryl dye, a quinophthalone dye, a triarylmethane dye, a phthalocyanine dye and a precursor thereof.

4,500,625

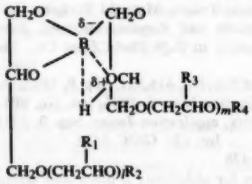
DEVELOPER FOR LIGHT-SENSITIVE LITHOGRAPHIC PRINTING PLATE PRECURSOR

Nobuyuki Kita; Hiroshi Matsumoto, and Hitoshi Hagiwara, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 4, 1983, Ser. No. 548,808
Claims priority, application Japan, Nov. 5, 1982, 57-194203
Int. Cl.³ G03C *5/24, 5/00;* G03F *7/08*
U.S. Cl. 430—149 **8 Claims**

1. A developer for a light-sensitive lithographic printing plate having an o-quinonediazide-containing light-sensitive layer, comprising an aqueous solution;

the aqueous solution containing an alkali silicate containing an organic boron compound represented by the formula:



wherein R_1 and R_3, which may be the same or different, each represents H or CH_3; R_2 and R_4, which may be the same or different, each represents H, COR_5 and $CONHR_6$, R_5 and R_6 each represents an alkyl group, an aryl group, an alkenyl group, or an alkynyl group; and l and m each represents an integer of 1 to 100, wherein the organic boron compound is present in the developer in an amount in the range of 0.0001 to 3% by weight based on the weight of the developer.

4,500,626

HEAT-DEVELOPABLE COLOR PHOTOGRAPHIC MATERIAL

Hideki Naito; Hiroshi Hara; Toshiaki Aono; Kozo Sato, and Shinsaku Fujita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1982, Ser. No. 431,861
Claims priority, application Japan, Oct. 2, 1981, 56-157798
The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.
Int. Cl.³ G03C *5/54, 1/40*
U.S. Cl. 430—203 **40 Claims**

1. A heat-developable color photographic material comprising a support having thereon at least a light-sensitive silver halide, an organic silver salt oxidizing agent, a hydrophilic binder, a dye releasing activator and a dye releasing compound represented by the following general formula and which is capable of reducing the organic silver salt oxidizing agent and/or the silver halide and which releases a hydrophilic dye, wherein said dye releasing compound is immobilized in a hydrophilic binder:

$$R—SO_2—D \qquad (I)$$

wherein R represents a reducing group capable of being oxidized by the organic silver salt oxidizing agent; and D represents a dye portion for forming an image.

32. A heat-developable color photographic material as claimed in claim 1, wherein the color photographic material further comprises an image receiving layer capable of receiving the hydrophilic diffusible dye.

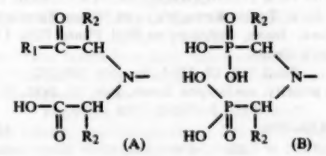
4,500,627

HEAT DEVELOPEMENT OF SILVER HALIDE ELEMENT WITH REDOX DYE RELEASER AND FOG REDUCER

Hideki Naito, and Yoshiharu Yabuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 16, 1984, Ser. No. 590,387
Claims priority, application Japan, Mar. 16, 1983, 58-43862
Int. Cl.³ G03C *1/40, 5/54, 5/26*
U.S. Cl. 430—203 **8 Claims**

1. A process for forming an image which comprises heating a light-sensitive material comprising a support having thereon at least a light-sensitive silver halide, a binder and a dye releasing redox compound which is reductive to the light-sensitive silver halide and capable of releasing a hydrophilic dye upon reaction with the light-sensitive silver halide by heating, after imagewise exposure or simultaneously with imagewise exposure, in a substantially water-free condition in the presence of a compound having at least one group represented by the formula (A) or (B):



wherein R_1 represents a hydroxyl group, an alkoxy group, an alkenyloxy group, an aryloxy group, or amino group, an N-alkylamino group, an N,N-dialkylamino group or an N-anilino group, and R_2 represents a hydrogen atom or an alkyl group, to imagewise form a mobile dye.

4,500,628

PROCESS OF MAKING SOLID STATE DEVICES USING SILICON CONTAINING ORGANOMETALLIC PLASMA DEVELOPED RESISTS

Gary N. Taylor, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 256,604, Apr. 22, 1981, Pat. No. 4,396,704. This application Jun. 27, 1983, Ser. No. 507,929

Int. Cl.[3] G03C *5/00, 5/24;* H05K *3/00*

U.S. Cl. 430—311 11 Claims

1. In a method of producing a solid state device that includes at least one pattern delineation steps, the steps comprising:

(a) selectively irradiating a resist film on a substrate with actinic radiation, wherein said film comprises a polymer and at least one type of monomer;

(b) treating said film to reduce the amount of said at least one type of monomer in the unirradiated portion of said film; and

(c) developing said film in a plasma comprising oxygen, thereby removing the unirradiated portion of the film at a faster rate than the irradiated portion, thereby producing a negative resist pattern, the invention CHARACTERIZED in that said at least one type of monomer includes at least one type of silicon-containing organometallic monomer selected from the group consisting of bis-acryloxybutyltetramethyldisiloxane, bis-methacryloxybutyltetramethyldisiloxane, m-dimethylphenylsilylphenyl acrylate or methacrylate.

4,500,629

METHOD OF FORMING IMAGES FROM LIQUID MASSES

Edward Irving, Burwell, and Terence J. Smith, Royston, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 25, 1983, Ser. No. 517,095

Claims priority, application United Kingdom, Apr. 8, 1982, 8222467

Int. Cl.[3] G03C *5/00*

U.S. Cl. 430—325 20 Claims

1. A process for the production of an image which comprises

(1) maintaining in a substantially oxygen-free environment a layer, supported on a substrate, of a liquid composition containing

(a) an anaerobically polymerisable material and

(b) a photopolymerisable material for a sufficient period for the layer of liquid composition to solidify,

(2) exposing imagewise to actinic radiation the solidified layer, and

(3) treating the layer with a developer to remove those parts of the layer which have not been exposed to the actinic radiation in (2).

4,500,630

METHOD FOR FORMING MAGENTA COLOR IMAGE

Tadahisa Sato; Toshio Kawagishi, and Nobuo Furutachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 15, 1984, Ser. No. 580,303

Claims priority, application Japan, Feb. 15, 1983, 58-23434

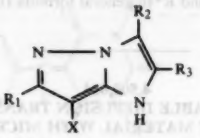
Int. Cl.[3] G03C *7/16, 7/40*

U.S. Cl. 430—386 16 Claims

1. A method of forming a magenta color image, comprising the steps of:

exposing a silver halide photosensitive material; and

developing the material to form an image, using a developing solution containing an aromatic primary amine, the developing being carried out in the presence of a coupler represented by the following general formula (I):



(I)

wherein R_1, R_2 and R_3 independently represent a hydrogen atom or a substituent group, and X represents a hydrogen atom or a coupling eliminable group.

4,500,631

RADIOGRAPHIC IMAGE FORMING PROCESS

Elichi Sakamoto; Mikio Kawasaki; Kouji Ono; Kakujulo Fukuoji, and Noboru Fujimori, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,829

Claims priority, application Japan, Aug. 12, 1982, 57-140743

Int. Cl.[3] G03C *5/24, 5/16*

U.S. Cl. 430—413 22 Claims

1. A radiographic image forming process comprising exposing a negative type silver halide photographic light-sensitive material, in combination with a fluorescent intensifying screen, imagewise to radiation rays, and treating said exposed material with a processing solution, said material comprising a support bearing on both sides thereof constituent layers, said constituent layers containing

(a) light-sensitive silver halide particles,

(b) metallic salt particles which are more readily soluble than said light-sensitive silver halide particles but whose surfaces are modified by a dissolution retarder so that said modified salt particles are rendered less soluble than said light-sensitive silver halide particles,

(c) physical development nuclei, and

(d) compounds comprising at least one kind of water-soluble dye having an absorption maximum in an aqueous solution from 400 to 600 nm, or a compound comprising said water-soluble dye coupled to a non-diffusive mordant, and

said processing solution containing

(i) at least one reducing agent, and

(ii) at least one substance capable of dissolving said metallic salt particles.

4,500,632

PROCESS FOR STABILIZING SILVER IMAGES

Kunioki Ohmura, Tokyo; Masaaki Torigoe, Kanagawa; Isamu Itoh, Kanagawa, and Katsumi Hayashi, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 416,521, Sep. 9, 1982, abandoned. This application Mar. 5, 1984, Ser. No. 584,301

Claims priority, application Japan, Sep. 9, 1981, 56-142022

Int. Cl.[3] G03C *5/24, 5/38*

U.S. Cl. 430—428 6 Claims

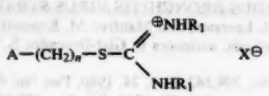
1. A process for stabilizing a black-and white silver image comprising the steps of:

providing a photographic material comprised of a water impermeable support having a light-sensitive silver halide emulsion layer thereon;

exposing the material;

subjecting the exposed material to development processing to obtain a developed image; and

processing the developed image with an aqueous solution containing a compound represented by the following general formula (I) or (II):



(I)

wherein:

A is —OH, —$SO_3^{\ominus}$ or

R_1 is H, an alkyl group having 1 to 5 carbon atoms, a substituted alkyl group or a phenyl group,

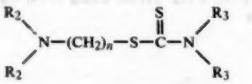
R_2 is an alkyl group having 1 to 5 carbon atoms or a substituted alkyl group,

$X^{\ominus}$ is a halogen atom or a p-toluenesulfonate, and

n is an integer of 2 to 5,

however, general formula (I) includes an HX salt when A is

(wherein X are the same as $X^{\ominus}$ described above);



(II)

or an HX salt thereof

wherein:

R_3 is H, an alkyl group having 1 to 5 carbon atoms, a substituted alkyl group or a phenyl group, and

n, R_2 and X are the same as in the general formula (I).

4,500,633

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hiroshi Menjo, Hachioji, and Yoshikazu Watanabe, Akishima, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Feb. 15, 1983, Ser. No. 466,590

Claims priority, application Japan, Feb. 15, 1982, 57/23296

Int. Cl.³ G03C *1/46*

U.S. Cl. 430—505 **8 Claims**

1. A silver halide photographic material comprising a support and two or more light-sensitive layers provided thereon that are sensitive to substantially the same spectral region and have different light sensitivities, wherein the light-sensitive layer having the highest light sensitivity contains only a compound of formula (I) and at least one of the remaining layers contains at least one compound of formula (II):

A—TIME—Z (I)

A—Z (II)

wherein A is a coupling component capable of reaction with the oxidized product of a color developing agent to release the group TIME—Z (wherein TIME represents a timing group and Z represents a development inhibitor).

4,500,634

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Kei Sakanoue; Morio Yagihara; Seigi Ichijima, and Kimitoshi Nagao, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 24, 1983, Ser. No. 526,171

Claims priority, application Japan, Aug. 24, 1982, 57-146712

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—544 **9 Claims**

1. A silver halide color photographic material which contains both a coupler capable of releasing a diffusible development restrainer upon coupling and a polymer coupler latex, said silver halide color photographic material having improved visual sharpness in a high spatial frequency region and in a low spatial frequency region due to the combined use of said coupler capable of releasing a diffusible development restrainer upon coupling and said polymer coupler latex.

4,500,635

COLOR PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Kozo Aoki; Akira Ogawa, and Osami Tanabe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 14, 1984, Ser. No. 589,294

Claims priority, application Japan, Mar. 14, 1983, 58-42671

Int. Cl.³ G03C *7/26*

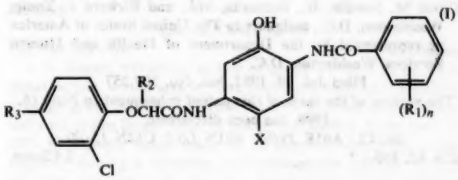
U.S. Cl. 430—552 **12 Claims**

1. A color photographic silver halide light-sensitive material, comprising:

a support base having thereon:

a silver halide emulsion layer comprised of silver halide particles dispersed in a binder; and

a cyan dye-forming coupler represented by general formula (I):



(I)

wherein R_1 is a hydrogen atom, a halogen atom, or an alkyl or alkoxy group having 1 to 20 carbon atoms, R_2 is an alkyl group having 1 to 20 carbon atoms, R_3 is a hydrogen atom, a halogen atom, or an alkyl group, X is a member to be released at the time of oxidative coupling with a developing agent, and n is an integer of 1 or 2.

4,500,636

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Mitsunori Ono; Isamu Itoh; Keiji Mihayashi, and Yukio Karino, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

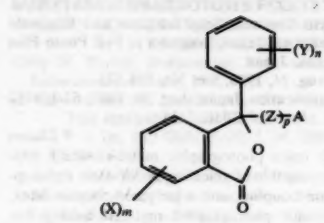
Filed Jan. 27, 1984, Ser. No. 574,432

Claims priority, application Japan, Jan. 27, 1983, 58/11676

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—566 **25 Claims**

1. A silver halide photographic light-sensitive material which comprises a light-sensitive silver halide emulsion layer having associated therewith a blocked photographic agent, said blocked photographic agent being represented by the following general formula (I):



(I)

wherein A represents a photographic agent moiety which is attached to a blocking moiety through a hetero atom; Z represents a divalent linkage group; p represents 0 or 1; X and Y each represents a halogen atom, an alkyl group, an alkenyl group, an aryl group, an alkoxy group, an aryloxy group, an acyloxy group, a carboxylic acid ester group, an amino group, a carbonamido group, a sulfonamido group, an ureido group, an aminosulfonamido group, a carbamate group, a carboxy group, an alkoxycarbonyl group, an aryloxycarbonyl, a carbamoyl group, an acyl group, a sulfo group, an alkylsulfonyl group, an arylsulfonyl group, a sulfamoyl group, a cyano group or a nitro group, and they may be the same as or different from each other; m represents an integer of 0 to 4; and n represents an integer of 0 to 5.

4,500,637

PREVENTION OF GRAFT VERSUS HOST DISEASE FOLLOWING BONE MARROW TRANSPLANTATION

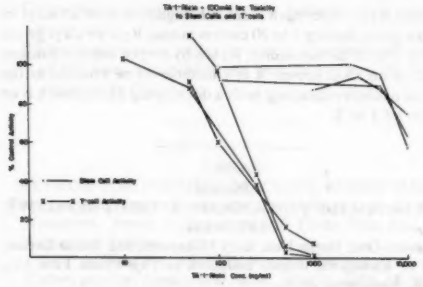
David M. Neville, Jr., Bethesda, Md., and Richard J. Youle, Washington, D.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jul. 19, 1982, Ser. No. 399,257

The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

Int. Cl.³ A61K *39/00*; A01N *1/02*; C12N *15/00*

U.S. Cl. 435—2 **2 Claims**



1. The method for treating graft versus host disease in humans comprising covalently linking an antibody TA:1 which specifically binds to human T:lymphocytes to intact ricin toxin in order to form a human T-cell specific hybrid; incubating said hybrid with human donor bone marrow cells prior to injecting said bone marrow cells into irradiated recipients, said TA:1 antibody is an antibody of the IgG2 subclass exhibiting an affinity for human T-cells of $10^{-9}M^{-1}$.

4,500,638

INFECTIOUS BRONCHITIS VIRUS STRAIN

Peter Apontoweil, Leersum, and Manfred M. Krasselt, De Bilt, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Division of Ser. No. 209,583, Nov. 24, 1980, Pat. No. 4,357,320. This application Oct. 29, 1982, Ser. No. 437,517

Claims priority, application Netherlands, Nov. 30, 1979, 7908687; Sep. 9, 1980, 8005063

Int. Cl.³ C12N *7/00*

U.S. Cl. 435—235 **4 Claims**

1. A serotype virus strain of infectious bronchitis viruses selected from the group consisting of culture Nos. CNCTC A 07/80, CNCTC A 08/80, CNCTC A 09/80, CNCTC A 010/80, CNCTC A 011/80, CNCTC A 013/80, CNCTC A 014/80, CNCTC A 015/80 and CNCTC A 016/80 deposited at the Czechoslovak National Collection of Type Cultures with the Institute of Hygiene and Epidemiology in Prague, Czechoslovia.

4,500,639

CULTURING BORDETELLA IN MEDIA CONTAINING ETHERIFIED CYCLODEXTRIN

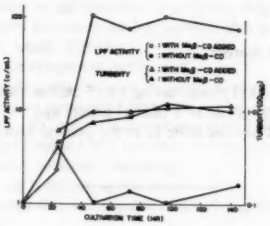
Yoji Suzuki; Atsushi Imaizumi; Hisao Yamaguchi; Masaharu Kanesaki, all of Hino, and Shoji Ono, Kodaira, all of Japan, assignors to Teijin Limited, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,039

Claims priority, application Japan, Oct. 15, 1981, 56-163477; Oct. 15, 1981, 56-163478

Int. Cl.³ C12N *1/38*; C12P *21/00*; C12Q *1/04*; C12R *1/01*

U.S. Cl. 435—244 **7 Claims**



1. A method of culturing microbes which belong to the genus Bordetella comprising culturing said microbes in a culture medium useful for cultivating said microbes wherein said culture medium comprises etherified cyclodextrin as an additional component.

4,500,640

PLASMIDS

Ryoichi Katsumata, Machida; Tetsuo Oka, Yokohama, and Akira Furuya, Kawasaki, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1982, Ser. No. 368,035

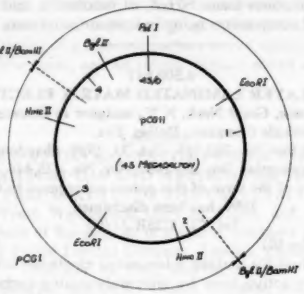
Int. Cl.³ C12N *1/20, 15/00, 1/00*; C12R *1/13*

U.S. Cl. 435—253 **9 Claims**

1. An isolated plasmid pCG 4 characterized by a molecular weight of about 19 megadaltons, a number of cleavage sites for the restriction endonucleases, Eco RI, Bam HI, Hind III, Pst I and Sal I of 4, 7, 9, 6 and 6 respectively, and carrying a gene for resistance to a least one of streptomycin and spectinomycin.

9. A biologically pure culture of a microorganism selected from the group consisting of *Corynebacterium herculis* ATCC

13868/pCG 4, *Brevibacterium flavum* ATCC 14067/pCG 4 and *Brevibacterium lactofermentum* ATCC13655/pCG 4 having the



identifying characteristics of ATCC 31837, 31838 and 31839 respectively and carrying the plasmid pCG 4.

4,500,641

FLOW CYTOMETER FOR IDENTIFYING ALGAE BY CHLOROPHYLL FLUORESCENCE

Gerrit J. van den Engh; Barbara J. Trask, both of Bodegraven, and Johannes W. M. Visser, Zevenhuizen, all of Netherlands, assignors to Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Mar. 22, 1982, Ser. No. 360,430

Claims priority, application United Kingdom, Mar. 23, 1981, 8109068

Int. Cl.[3] **C12M** *1/34;* **C12Q** *1/29, 1/04;* **G01J** *3/30*

U.S. Cl. 435—291 **6 Claims**

1. Flow cytometer for identifying algae by chlorophyll fluorescence comprising:

one high intensity light source comprising two independent lasers having parallel light paths one of which is operated in a UV range and the other in an all lines mode,

a prism in the light path of the laser operated in the all lines mode,

means for passing the algae through the light paths,

detector means aligned with the light paths for detecting forward scatter and producing a signal,

detector means for detecting backward scatter and producing a signal,

means aligned perpendicularly to the light paths for detecting perpendicular scatter comprising a lens, a dichroic mirror, a chlorophyll fluorescence detector receiving light passing the dichroic mirror, a yellow fluorescence detector receiving light reflected by the dichoric mirror, and band pass filters in front of each detector; each detector producing a signal, and

means for displaying the signals.

4,500,642

INFRARED ABSORBING QUARTZ GLASS WITH IRON AND ALUMINUM

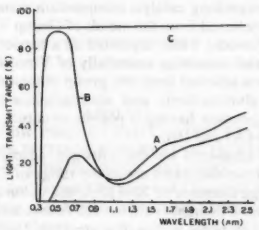
Oguma Reiji, Hatano, and Hirai Akihiro, Odawara, both of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Division of Ser. No. 331,901, Dec. 18, 1981, Pat. No. 4,419,118. This application Mar. 4, 1983, Ser. No. 472,272

Claims priority, application Japan, Dec. 23, 1980, 55-181294

Int. Cl.[3] **C03C** *3/06, 3/24*

U.S. Cl. 501—54 **14 Claims**



1. An infrared-absorbing and visible light-transmitting quartz glass consisting essentially of 0.01 to 5% by weight iron, 0.01 to 10% by weight aluminum and the balance being silicon oxide.

4,500,643

SHAPED REFRACTORY METAL BORIDE ARTICLES AND METHOD OF MAKING THEM

Adam J. Gesing, and Graham Stratford, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Dec. 27, 1983, Ser. No. 565,622

Claims priority, application United Kingdom, Dec. 30, 1982, 8236995

Int. Cl. C04H *35/58*

U.S. Cl. 501—96 **18 Claims**

1. A shaped refractory article of group IV b, V b, or VI b metal boride, which article has a microstructure with a weight average grain diameter of from 0.5 to 5 microns and substantially no grains larger than 10 microns diameter, from 10% to 45% by volume being made up of interconnected pores the majority having a diameter not substantially greater than 5 microns, porosity and grain size being substantially uniform throughout the microstructure, the article containing not more than about 0.2% by weight of oxygen and not more than about 0.5% by weight of carbon.

4,500,644

PREPARATION AND COMPOSITION OF SIALON GRAIN AND POWDER

Howard M. Winkelbauer, West Mifflin, Pa.; Kenneth W. Hill, Lynchburg, Va., and Ke-Chin Wang, Pittsburgh, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 19, 1983, Ser. No. 562,770

Int. Cl.[3] **C04B** *35/58*

U.S. Cl. 501—98 **8 Claims**

1. A method for producing nitride bonded ceramic grain comprising the steps of:

mixing, a composition consisting essentially of, by weight, 62–90% micronized silicon powder and about 10 to 38% fine grain alumina powder;

ball milling the composition to thoroughly disperse the silicon and alumina powders;

compacting the composition to increase the density thereof; and

burning the composition at an elevated temperature in a nitriding atmosphere to form the nitride bond.

4,500,645

HYDROCRACKING CATALYST COMPOSITION AND METHOD OF MAKING SAME

Jun Fuchikami, Koga; Hidehiro Higashi, Kitakyushu; Takashi Inoue, Kitakyushu, and Hiroyuki Oba, Kitakyushu, all of Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,357
Claims priority, application Japan, Jun. 13, 1981, 56-91109
Int. Cl.³ B01J *29/10, 29/16*
U.S. Cl. 502—65 12 Claims

1. A hydrocracking catalyst composition comprising one or more metals selected from the metals of Group VIb and Group VIII of the Periodic Table deposited on a carrier material, said carrier material consisting essentially of Y-zeolite and one or more members selected from the group consisting of alumina-zinc oxide, alumina-boria and alumina-silica-magnesia, said catalyst composition having a porous structure satisfying the requirements (A) and (B):

(A) when measured by the nitrogen adsorption method, pores whose diameters are in the range of 25–600 Å have an average diameter of 70–110 Å, the volume occupied by pores whose diameters are 60–120 Å is at least 40% of that occupied by pores whose diameters are 25–600 Å, and the volume occupied by pores whose diameters are 25–600 Å is 30% or less of that occupied by pores whose diameters are 25–600 Å, and

(B) when measured by means of a porosimeter under pressure, pores whose diameters are in the range of 62–600 Å have an average diameter of 70–110 Å, the volume occupied by pores whose diameters are in the range of average diameter ±20 Å is at least 40% of that occupied by pores whose diameters are 62–600 Å, and the volume occupied by pores whose diameters are in the range of average diameter +20 Å or higher is 40% or less of that occupied by pores whose diameters are 62–600 Å.

4. A catalyst composition according to claim 1 wherein the Y-zeolite is ion-exchanged by both rare earth and ammonium.

9. A method of making a hydrocracking catalyst which comprises the steps of preparing an amorphous alumina hydrate slurry containing pseudo-boehmite having a crystal size grown to 40–80 Å; dehydrating said amorphous alumina hydrate slurry to obtain an alumina cake; mixing Y-zeolite and one or more members selected from the group consisting of a precursor of zinc oxide, a precursor of boria and silica-magnesia, with said alumina cake; molding the resulting mixture to obtain a crrier material having the desired shape and size, and thereafter depositing, on said carrier material, one or more metals selected from the metals of Group VIb and Group VIII of the Periodic Table.

4,500,646

CONVERSION CATALYSTS FOR SYNTHESIS GAS

Bernard Denise, Rillieux; Christian Hamon, Saint Nazaire; Michel Sénès, La Baule, and Raymond Sneeden, Villefontaine, all of France, assignors to Societe Chimique de la Grande Paroisse, Azote et Producits Chimiques, Paris, France

Filed Jan. 12, 1983, Ser. No. 457,411
Claims priority, application France, Jan. 14, 1982, 82 00498; Jun. 25, 1982, 82 11134
Int. Cl.³ B01J *29/18, 29/24*
U.S. Cl. 502—78 7 Claims

1. A catalyst for the conversion of synthesis gas into organic compounds, in particular saturated and unsaturated hydrocarbons, consisting essentially of:

a first component comprising a mixture of the reduced form of least two transition metals selected from the group consisting of copper, zinc and chromium, one of said selected transition metals being zinc;

a second component comprising an active mordenite selected from the group consisting of mordenites derived from the chemical de-aluminization of mordenite by successive treatments in a concentrated acid medium and doubly de-aluminized mordenites derived from hydrothermic de-aluminization consisting of a series of alternate acid and hydrothermic treatments, beginning and terminating in an acid treatment, from the sodium form, NaZ, or ammonium form, NH_4Z, of mordenite, said first and second components being in intimate admixture.

4,500,647

THREE LAYER LAMINATED MATRIX ELECTRODE

Frank Solomon, Great Neck, N.Y., assignor to Diamond Shamrock Chemicals Company, Dallas, Tex.

Division of Ser. No. 202,585, Oct. 31, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 425,444
The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.
Int. Cl.³ C25B *11/00*
U.S. Cl. 502—101 8 Claims

1. A method for making a laminated electrode comprising preparing an active layer by intimately mixing carbon black particles with an aqueous dispersion of polytetrafluoroethylene particles, drying the resultant mixture at temperatures in the range of from about 250° to 325° C., thoroughly incorporating into the thus dried PTFE/carbon black mixture enough deashed active carbon particles which have been impregnated with a minor amount of a precious metal catalyst to form an intimate mix containing about 40 to 80% of said active carbon particles based upon the combined weight of same and the dried PTFE/carbon black, fibrillating said intimate mix and forming the resultant fibrillated mix into an active layer, and laminating the working surface of said active layer to a current distributor and the opposite surface thereof to a porous, coherent, hydrophobic polytetrafluoroethylene-containing wet-proofing layer.

4,500,648

LONG CHAIN BRANCHING IN POLYOLEFINS FROM ZIEGLER-NATTA CATALYSTS

Dennis B. Malpass, LaPorte, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.Y.

Filed Apr. 25, 1983, Ser. No. 488,321
Int. Cl.³ C08F *4/62, 4/64, 4/68, 4/70*
U.S. Cl. 502—115 10 Claims

1. An ethylene polymerization catalyst comprising:

(a). a Group 4B to 8 transition metal compound,

(b). an organoaluminum compound of the general formula $R_1R_2AlR_p$ wherein R_1 and R_2 are the same or different hydrocarbyl groups having from 1 to 18 carbon atoms and R_p is a polymeric hydrocarbyl group having a weight average molecular weight in the range of about 1000 to about 100,000 and a long chain branching frequency of about 0.0005 to about 0.005 per unit molecular weight, and

(c). an aluminum alkyl cocatalyst.

4. The ethylene polymerization catalyst of claim 1 wherein the Group 4B to 8 transition metal compound is a titanium halide.

5. The ethylene polymerization catalyst of claim 4 wherein the titanium halide is obtained from the reaction product of titanium tetrachloride with an organomagnesium compound or complexes thereof.

4,500,649

PROCESS FOR PRODUCING AQUEOUS SUSPENSION CONTAINING ORGANIC AZO COMPOUND AS POLYMERIZATION INITIATOR

Motoaki Tanaka, Urawa; Takanori Toyama, Kawagoe; Hitoshi Ohba, Saitama, and Osamu Yamaguchi, Sayama, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Japan

Filed Oct. 12, 1982, Ser. No. 433,690
Claims priority, application Japan, Oct. 12, 1981, 56-162190
Int. Cl.³ B01J *31/06*
U.S. Cl. 502—167 19 Claims

17. An aqueous suspension comprising an organic azo com-

pound as polymerization initiator in fine particles; water; a dispersing agent A, the dispersing agent A being a synthetic high polymer, a cellulose derivative, an animal protein, a vegetable mucilage, a material derived from seaweeds, a starch or fabricated starch; and a dispersing agent B selected from the group consisting of a nonionic surface active agent, a cationic surface active agent, and an anionic surface active agent.

4,500,650

THREE-WAY CATALYSTS FOR PURIFICATION OF EXHAUST GAS AND METHOD FOR THE PREPARATION OF THE CATALYSTS

Michael Wyatt, Wallingford; Gary M. Leach, and Ashley M. Gould, both of Reading, all of England, assignors to Johnson Matthey Public Limited Company, London, England

Filed Jan. 18, 1982, Ser. No. 340,046

Claims priority, application United Kingdom, Jan. 20, 1981, 8101603

Int. Cl.³ B01J *23/64*

U.S. Cl. 502—204 **10 Claims**

1. A three-way catalyst suitable for the purification of exhaust gas from an internal combustion engine in a motor vehicle, the catalyst comprising:

a. a monolithic substrate through which exhaust gas may flow,

b. a refractory oxide layer deposited on the substrate,

c. at least one platinum group metal component selected from the group consisting of platinum, rhodium and palladium, and

d. a tungsten component selected from the group consisting of tungsten metal and a tungsten-containing compound the amount of platinum group metal present being from 300 to 3500 g per m^3 of the volume of the monolithic substrate with the refractory oxide layer deposited thereon, the amount of tungsten present being at least from 2650 to 22,000 g per m^3 of said volume of substrate and deposited oxide layer, and the weight ratio of tungsten to platinum group metal being from 2.3 to 18.8:1, the catalyst being further characterized by its ability to oxidize carbon monoxide and hydrocarbon, and to reduce nitrogen oxides with a reduced tendency to form ammonia.

4,500,651

TITANIUM-CONTAINING MOLECULAR SIEVES

Brent M. T. Lok, New City; Bonita K. Marcus, Rye, and Edith Flanigen, M., White Plains, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1983, Ser. No. 480,738

Int. Cl.³ B01J *27/14, 31/02*

U.S. Cl. 502—208 **22 Claims**

1. Crystalline molecular sieves comprising pores having nominal diameters of greater than about 3 Angstroms and whose chemical composition in the as-synthesized and anhydrous form is represented by the unit empirical formula:

$$mR:(Ti_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the moles of "R" present per mole of $(Ti_xAl_yP_z)O_2$ has a value of between zero and about 5.0; and "x", "y" and "z" represent the mole fractions of titanium, aluminum and phosphorus, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D and E of the ternary diagram which is FIG. 1 of the drawings, said points A, B, C, D and E representing the following values for "x", "y" and "z":

	Mole Fraction		
Point	x	y	z
A	0.001	0.45	0.549
B	0.88	0.01	0.11
C	0.98	0.01	0.01
D	0.29	0.70	0.01
E	0.001	0.70	0.299.

4,500,652

PROCESS FOR PRODUCING CATION EXCHANGE RESINS WITHOUT SWELLING DURING SULPHONATION PROCESS

Yoshiharu Misaka; Takeshi Teraue, and Masamiti Hatae, all of Fukuoka, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,682

Claims priority, application Japan, Aug. 21, 1981, 56-131356

Int. Cl.³ L08F *8/36;* B01J *1/08*

U.S. Cl. 521—33 **6 Claims**

1. A process for producing particles of a cation exchange resin which comprises suspension polymerizing a monomeric mixture consisting essentially of (1) styrene, (2) 0.8 to 55 mole % of divinylbenzene per mole of styrene and (3) 2 to 20 mole % of at least one compound selected from the group of acrylic acid, methacrylic acid and lower alkyl ester thereof, per mole of styrene and sulfonating the resulting copolymer particles substantially in the absence of a swelling agent consisting of organic solvent, wherein said particles have a particle size within the range of from about 0.1 to 1.0 mm and wherein the number of cation exchange resin particles having cracks present per 100 resin particles is 10 or less.

4,500,653

BLOWING AGENTS FOR THERMOPLASTIC COMPOSITIONS

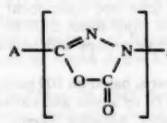
Manfred Schmidt; Mark W. Witman, both of Krefeld, Fed. Rep. of Germany; Gerard E. Reinert, McMurray, and In C. Lim, Pittsburgh, both of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 14, 1983, Ser. No. 531,982

Int. Cl.³ C08J *9/10*

U.S. Cl. 521—90 **12 Claims**

1. A molding composition comprising (a) a thermoplastic resin and (b) about 0.1 to about 25% relative to the weight of said (a) plus (b) of a chemical blowing agent characterized in that its molecular structure contains at least one pentatomic heterocyclic ring and conforms to



wherein A and A' are moieties which do not negate the foaming ability of said (b) and which do not contribute to the degradation of said (a) upon foaming.

4,500,654

CATALYST SYSTEM AND PROCESS FOR THE PRODUCTION OF POLYURETHANES

Russell O. Carlsen, Barrington; Francois M. Casati, Highland Park, and Daniel S. Raden, Hawthorn Woods, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 1, 1983, Ser. No. 547,691
Int. Cl.³ C08G 18/20, 18/14; B01J 27/24
U.S. Cl. 521—129 20 Claims

1. A catalyst for use in reacting an organic isocyanate with an organic polyol to produce a polyurethane, the catalyst comprising an at least mono-N-substituted alkoxyalkyl piperazine.

15. A process for producing a polyurethane comprising reacting an organic isocyanate with an organic polyol in the presence of a catalyst comprising effective amount of an at least mono-N-substituted alkoxyalkyl piperazine.

4,500,655

ALKOXYLATED MODIFIED MANNICH CONDENSATES AND MANUFACTURE OF RIGID POLYURETHANE FOAMS THEREWITH

Michael E. Brennan, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,756
Int. Cl.³ C08G 18/14
U.S. Cl. 521—163 21 Claims

1. A polyol composition prepared by reacting an alkoxylation product of a Mannich condensate with about 3 to about 10 percent by weight of melamine based on the alkoxylation product and with about 1 to about 6 moles of a lower alkylene carbonate per mole of melamine at about 80° to about 150° C. for about 1 to 5 hours, said alkoxylation product having been prepared by reacting an alkylene oxide component comprising from about 90 to 100 wt.% of propylene oxide and 0 to about 10 wt.% of ethylene oxide with a Mannich condensate, said Mannich condensate having been prepared by reacting a phenolic compound with formaldehyde and diethanolamine in the molar ratios of about 1 to about 3 moles of formaldehyde and about 1 to about 3 moles of diethanolamine per mole of said phenolic compound, said phenolic compound being selected from the group consisting of phenol and phenol substituted with an alkyl group containing 1 to 12 carbon atoms.

4,500,656

PROCESS FOR THE PREPARATION OF A CELLULAR POLYURETHANE

Werner Rasshofer, Cologne, and Ernst-Christoph Prolingheuer, Herne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,054
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1983, 3312215
Int. Cl.³ C08G 18/14, 18/32
U.S. Cl. 521—164 12 Claims

1. A process for the preparation of a cellular polyurethane which comprises reacting

(A) a polyisocyanate with

(B) an isocyanate-reactive component containing

(1) at least one component in the molecular weight range of from about 60 to 2000 containing isocyanate-reactive groups and having a functionality of 2 to 8,

(2) optionally at least one component in the molecular weight range of from about 2000 to 12000 containing isocyanate-reactive groups and having a functionality of 2 to 8,

(3) about 0.1–30 parts, based on 100 parts of B(1)+B(2), of a liquid adduct of an amine and carbon dioxide, and

(4) optionally water, blowing agents, foam stabilizers, catalysts and other auxiliary agents and additives,

wherein the liquid amine-carbon dioxide adduct is a liquid adduct at 20° C., optionally containing water, based on carbon dioxide and an amine which has at least one amino group and contains at least one primary, secondary or tertiary hydroxyl group, which amine is solid or liquid at 20° C.

4,500,657

DENTAL RESTORATIVE COMPOSITIONS HAVING IMPROVED MECHANICAL PROPERTIES AND HYDROLYTIC STABILITY

Narayan G. Kumar, Freehold, N.J., assignor to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Continuation-in-part of Ser. No. 404,262, Aug. 2, 1982, abandoned. This application Jul. 1, 1983, Ser. No. 509,770
Int. Cl.³ A61K 5/06
U.S. Cl. 523—116 20 Claims

1. A dental restorative composition consisting essentially of:

(a) a polymerizable composition containing at least one compound having at least two olefinically unsaturated groups, wherein, when said polymerizable composition is polymerized in the unfilled state, the resulting cured material has a water absorption as determined by ADA Specification No. 27 at 37° C. for one week, of less than 1 milligram per square centimeter;

(b) a polymerization initator for said polymerizable composition; and

(c) a hydrophobic inorganic filler having a volume average particle size below 15 microns, at least 30 percent of the particles of said filler having a size of less than 5 microns, said filler being present in an amount within the range of from about 35 to about 70 volume percent, based on weight of said polymerizable composition plus said filler, and said filler being selected from the group consisting of quartz and acid-washed and heat treated barium or strontium glass, wherein the heat treatment is carried out at a temperature below the sintering temperature of the glass, and at a temperature and for a period of time sufficient to effect at least a 50 percent reduction in the specific surface area of the glass.

4,500,658

RADIOPAQUE ACRYLIC RESIN

Adrian S. Fox, Denver, Conn., assignor to Austenal International, Inc., Chicago, Ill.

Filed Jun. 6, 1983, Ser. No. 501,590
Int. Cl.³ C08K 3/10, 5/54, 5/06; A61K 5/06
U.S. Cl. 523—117 9 Claims

1. A process for preparing a radiopaque acrylic particle in bead form comprising:

(a) substantially uniformly dispersing in an acrylic monomer from about 5 to 50 wt.% of a radiopaque inorganic pigment having an average particle size of from about 0.1 to 20 microns, an effective amount of a surfactant and an effective amount of a free radical-forming polymerization initiator; and

(b) contacting drops of the resulting monomer-pigment dispersion with an aqueous solution containing an effective amount of a dispersant at a temperature of from about 50° to 125° C. to polymerize said monomer.

4,500,659

EXTRUDABLE, CURABLE POLYORGANOSILOXANE COMPOSITIONS

Loretta A. Kroupa, Midland, and Elton H. Relyea, Gladwin, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 5, 1983, Ser. No. 520,794
Int. Cl.³ C08K 3/36
U.S. Cl. 523—213 14 Claims

1. An extrudable, curable silicone elastomer composition exhibiting a viscosity of at least 100 Pa·s at 25° C. and comprising a product obtained by mixing

(A) 100 parts by weight of a liquid triorganosiloxy-endblocked polydimethylsiloxane wherein the triorganosiloxy units are dimethylvinylsiloxy or methylphenylvin-

ylsiloxy and the polydimethylsiloxane exhibits a viscosity of from 1 to 100 Pa-s at 25° C.;

(B) from 10 to 85 parts by weight of a reinforcing silica filler having a surface area of at least 50 m^2/g, said filler having been reacted with a liquid or solubilized treating agent wherein at least a portion of said treating agent is a liquid, hydroxyl endblocked polyorganosiloxane wherein at least 50% of the silicon atoms are bonded to a fluorine-substituted hydrocarbon radical;

(C) a liquid methylhydrogensiloxane in an amount sufficient to provide from 1 to 3 silicon-bonded hydrogen atoms per vinyl radical present in said curable elastomer composition, said methylhydrogensiloxane having an average of at least three silicon-bonded hydrogen atoms per molecule and consisting essentially of units selected from the group consisting of methylhydrogensiloxane, dimethylsiloxane, dimethylhydrogensiloxy, trimethylsiloxy and $SiO_{4/2}$ units; and

(D) a platinum-containing catalyst in sufficient amount to provide at least 0.1 part by weight of platinum per million parts by weight of said triorganosiloxy endblocked polydimethylsiloxane.

4,500,660

EPOXY RESIN COMPOSITION

Tsuyoshi Minamisawa; Yasuo Kogo, and Yasuhisa Nagata, all of Shizuoka, Japan, assignors to Toho Belson Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 486,177
Claims priority, application Japan, Apr. 21, 1982, 57-66504
Int. Cl.³ C08K *7/06;* **C08L** *63/02, 63/04, 63/10*
U.S. Cl. 523—428 **26 Claims**

1. An epoxy resin composition comprising:

(A) a condensation product of bisphenol A and epichlorohydrine present in an amount of at least 45 wt % of the total epoxy resin

(B) a reaction product of novolak resin and epichlorohydrine present in an amount of at least 8 wt % of the total epoxy resin;

(C) an epoxy resin having at least one N,N-diglycidylamine group in a molecule of the epoxy resin (including the one used in (D)) present in an amount of at least 15 wt % of the total epoxy resin; (D) a reaction product of a butadiene-acrylonitrile copolymer having carboxyl groups on at least both ends of the molecule and an epoxy resin having at least one N,N-diglycidylamine group in a molecule of the epoxy resin, said butadiene-acrylonitrile copolymer being present in an amount of 1.5 to 15 parts by weight per 100 parts by weight of the total epoxy resin; (E) nitrile rubber present in an amount of 2 to 8 parts by weight per 100 parts by weight of the total epoxy resin; wherein the total epoxy resin is the total amount of epoxy resins (A), (B) and (C), as well as the epoxy resin having at least one N,N-diglycidylamine group in a molecule of the epoxy resin used in preparing component (D);

(F) a curing agent consisting of dicyandiamide; (G) a curing accelerator, and (H) a reinforcing carbon fiber.

4,500,661

ADHESIVE COMPOSITION

Pallavoor R. Lakshmanan, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 848,285, Nov. 3, 1977, abandoned. This application Nov. 24, 1980, Ser. No. 209,375
The portion of the term of this patent subsequent to Sep. 11, 1996, has been disclaimed.
Int. Cl.³ C08L *93/00*
U.S. Cl. 524—77 **20 Claims**

1. A novel adhesive composition effective in bonding low-energy plastic surfaces to each other which provides a tensile lap shear strength in excess of about 520 pounds per square inch gauge which comprises (1) one ethylene-vinyl ester copolymer having from about four to about 30 wieght percent of a vinyl ester and a melt index of about 0.5 to about 75; (2) a tackifier selected from the group consisting of (a) a rosin, (b) a rosin ester, (c) a terpene resin, (d) a terpene-phenolic resin and (e) a rosin-modified phenolic resin; and (3) a polyethylene wax having a molecular weight of about 750 to about 3000, a penetration of about 0.25 to about 1.5, a density of about 0.93 to about 0.97, a melting point of at least about 110° C. and a linearity of at least about 70 percent, said novel adhesive composition having a Ring and Ball softening point of at least about 110° C.

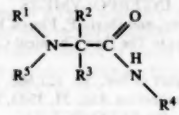
4,500,662

POLYSUBSTITUTED α-AMINOACETAMIDES

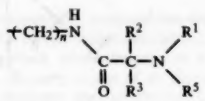
John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 250,826, Apr. 3, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 427,347
Int. Cl.³ C08K *5/20;* **C07C** *103/727, 103/50;* **C07D** *211/00*
U.S. Cl. 524—99 **5 Claims**

1. An α-aminoacetamide of the formula



wherein R^1 is tert-alkyl of 4 to 12 carbons; R^4 is selected from the group consisting of alkyl of 1 to 8 carbons; phenyl; alkyl-, alkoxy-, alkylamine-, dialkylamine- or halo-substituted phenyl having 1 to 3 said substituents wherein alkyl groups have 1 to 12 carbons; cycloalkyl of 4 to 8 carbons; piperidinyl; 2,2,6,6-tetra(lower alkyl)piperidinyl; alkenyl of 2 to 6 carbons, and a group



wherein n is 1 to 6; R^2 and R^3 are independently selected from the group consisting of hydrogen and alkyl of 1 to 6 carbons; and R^5 is hydrogen.

4. A synthetic polymeric material subject to degradation caused by ultraviolet light, containing an effective amount of a compound of claim 1 as a stabilizer.

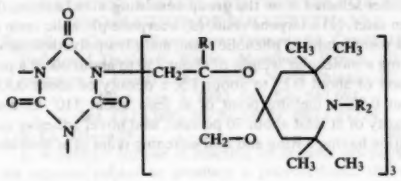
4,500,663

LIGHT STABILIZING N,N,N-TRIS(2,2,6,6-TETRAMETHYL-4-PIPERIDONE KETAL)-1,3,5-TRIAZINE DERIVATIVES AND LIGHT STABILIZED SYNTHETIC RESIN COMPOSITIONS

Motonobu Minagawa, Koshigaya; Naohiro Kubota, Ageo; Toshihiro Shibata, Omiya, and Ryozo Arata, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Mar. 25, 1983, Ser. No. 478,609
Claims priority, application Japan, Mar. 31, 1982, 57-53270
Int. Cl.³ C07D *405/14*
U.S. Cl. 524—101 **22 Claims**

1. An N,N,N-tris(2,2,6,6-tetramethyl-4-piperidone ketal)-1,3,5-triazine having the formula:



wherein:

R_1 is selected from the group consisting of hydrogen and alkyl having from one to about four carbon atoms; and

R_2 is selected from the group consisting of hydrogen; oxyl O·; alkyl, hydroxy alkyl and epoxyalkyl having from one to about eighteen carbon atoms; alkanoyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about eighteen carbon atoms; phenyl; phenalkyl and alkylphenyl having from seven to about twenty-four carbon atoms.

4,500,664

STABILIZED CARBOXYL-CONTAINING ETHYLENE INTERPOLYMERS

Osborne K. McKinney, and David P. Flores, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

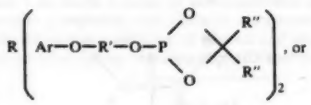
Continuation-in-part of Ser. No. 321,668, Nov. 16, 1981, abandoned. This application Aug. 31, 1983, Ser. No. 528,024

Int. Cl.³ C08K *5/52*

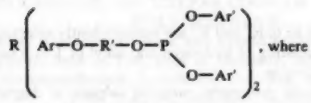
U.S. Cl. 524—119 **16 Claims**

1. A composition of matter comprising an ethylene/acrylic acid or ethylene/methacrylic acid interpolymer having incorporated therein a minor amount of at least one aromatic bis(organophosphorous) compound selected from those conforming to the formulae

I.



II.



R′ is an alkylene or alkylidene of C_1–C_8,

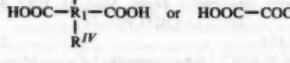
R is an alkylene or alkylidene of C_1–C_8, including those having one or more ether or thioether groups in the molecule,

Ar represents biphenylene or phenylene, whether substituted or not,

Ar′ represents, independently of each other, any of the Ar groups described above,

R″ represents alkyl groups of C_1–C_8, including those represented by R and R′ described above,

and, in addition thereto, a minor amount of at least one hindered phenolic antioxidant and/or a minor amount of at least one dicarboxylic acid of the formula



where R_1 represents an aliphatic or aromatic grouping containing C_1 to C_{24}, R^{III} and R^{IV} each, independently, represent amino, mercapto, phosphate, carboxyl, or hydroxyl group or hydrogen.

4,500,665

CODISPERSED PARTICULATE LUBRICANT STABILIZER COMPOSITIONS FOR SYNTHETIC RESINS

Lawrence R. Brecker, Brooklyn, and Charles Keeley, Wantagh, both of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jun. 27, 1983, Ser. No. 507,851

Int. Cl.³ C08K *5/20*

U.S. Cl. 524—227 **16 Claims**

1. Codispersed particulate lubricant stabilizer compositions for synthetic resins, the particles consisting essentially of the product prepared by blending from about 4 parts to about 1 part polyvalent metal fatty acid soap with from about 1 part to about 4 parts alkylene-bis-(fatty acid amide), and heating until water of reaction is no longer released.

11. Polyvinyl chloride resin compositions comprising a polyvinyl chloride resin and a codispersed particulate lubricant stabilizer composition according to claim 1.

4,500,666

RUBBER COMPOSITION CONTAINING NON-TACKINESS-IMPARTING AGENT AND CONVEYOR BELT HAVING SURFACE LAYER MADE OF VULCANIZATE OF SAID COMPOSITION

Noriaki Wada, Kobe, Japan, assignor to Bando Chemical Industries, Ltd., Kobe, Japan

Filed May 12, 1983, Ser. No. 494,052

Claims priority, application Japan, May 16, 1982, 57-82796; May 16, 1982, 57-82797; May 16, 1982, 57-82798

Int. Cl.³ C08K *5/20;* **C08L** *7/00, 9/00, 83/04*

U.S. Cl. 524—232 **11 Claims**

1. A rubber composition comprising:

(1) 100 parts by weight of a rubber mixture of 98 to 80% by weight of at least one organic rubber selected from the group consisting of natural rubber and organic synthetic diene rubbers and 2 to 20% by weight ofa silicone raw rubber comprising an organo polysiloxane of the formula $-R_2SiO-$, wherein R is alkyl, alkenyl, arlkyl, haloalkyl or cyanoalkyl; said organopolysiloxane having a molecular weight of 100,000 to 1,000,000, and

(2) 0.5 to 50 parts by weight of at least one non-tackiness-imparting agent selected from the group consisting of fatty acid amides.

4,500,667

POLYMER BLENDED MEMBRANES

Anthony J. Polak, Lake Zurich, and Allyson J. Beuhler, Indian Head Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 26, 1983, Ser. No. 545,704

Int. Cl.³ C08K *3/10*

U.S. Cl. 524—406 **7 Claims**

1. A thin film membrane which comprises a blend of: (1) from about 10% to about 70% by weight of a heteropoly acid and salts thereof having the generic formula:

$$A_m[X_xY_yO_z].nH_2O$$

in which X is selected from the group consisting of boron, aluminum, gallium, silicon, germanium, tin, phosphorus, arsenic, antimony, bismuth, selenium, tellurium, iodine, and metals of the first, second, third and fourth transitional metal series of the Periodic Table and where Y is dissimilar from X and is selected from at least one metal of the first, second, third and fourth transitional metal series of the Periodic Table, A is selected from the group consisting of hydrogen, ammonium, sodium, potassium, lithium, rubidium, cesium, beryllium, mag-

nesium, calcium, strontium and barium, m is an integer of from about 1 to 10, y is an integer of from 6 to 12 based on x being equal to 1, z is an integer of from 30 to 80 and n is an integer of from 3 to 100 and, (2) from about 90% to about 30% by weight of a polymer compatible with said compound selected from the group consisting of poly (vinyl alcohol), poly(vinyl fluoride), polyethylene oxide, polyethyleneinine, polyvinylmethylethyl ether and phenol formaldehyde resins.

4,500,668

RESIN COMPOSITION FOR MOLDING MATERIALS

Senzo Shimizu, Odawara; Isao Nomura, Hiratsuka; Kazuo Yamamiya, Chigasaki, and Tsuneaki Masuda, Hiratsuka, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Sep. 21, 1983, Ser. No. 534,149

Claims priority, application Japan, Sep. 24, 1982, 57-166303

Int. Cl.³ C08K *3/40, 3/26*

U.S. Cl. 524—427 **6 Claims**

1. A resin composition for molding materials, said composition comprising

(I) 100 parts by weight of a resin composition composed of

(A) 5 to 95 parts by weight of a polyamide resin composed of 1 to 99% by weight of a polyamide resin obtained from xylylenediamine and an alpha, omega-linear aliphatic dibasic acid and 99 to 1% by weight of nylon 66, and

(B) 95 to 5 parts by weight of a styreneacrylonitrile copolymer containing 5 to 50 mole % of acrylonitrile as a copolymer component, and

(II) 5 to 150 parts by weight of an inorganic filler.

4,500,669

TRANSPARENT, ABRASION RESISTANT COATING COMPOSITIONS

L. T. Ashlock, Lake Forest; Harold Mukamal, Seal Beach, and William H. White, La Puente, all of Calif., assignors to Swedlow, Inc., Garden Grove, Calif.

Continuation of Ser. No. 845,915, Oct. 27, 1977, abandoned. This application Apr. 3, 1980, Ser. No. 136,757

Int. Cl.³ C08K *3/08;* **C08L** *83/06*

U.S. Cl. 524—440 **18 Claims**

1. A coating composition which forms a transparent, abrasion-resistant coating upon curing, said coating composition consisting essentially of an effective abrasion-resisting amount of a colloidal dispersion of a water insoluble dispersant in a water-alcohol solution of the partial condensate of R Si $(OH)_3$ where R is an organic radical, and said dispersant is a metal or a metal alloy selected from the group consisting of antimony, aluminum, gold, silver, copper, tin, cadmium, indium and mixtures thereof.

4,500,670

COMPOSITE MIXTURES FOR IMPROVING GEL STRENGTH OF WATER ABSORBENT GELS

Mark J. McKinley, Linwood, and Dan P. Sheridan, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 22, 1983, Ser. No. 554,156

Int. Cl.³ C08K *3/34*

U.S. Cl. 524—445 **22 Claims**

1. An improved water absorbent composition comprising (1) a water absorbing amount of a lightly crosslinked, water-swellable hydrophilic polymer and (2) an inorganic powder in an amount sufficient to increase gel strength exhibited by said water absorbent composition, wherein said composition is prepared by physically blending said inorganic powder with said polymer and wherein said powder is blended with said polymer after the polymer has been polymerized and crosslinked.

4,500,671

REINFORCED POLYURETHANE THERMOPLASTIC CHEMICAL MATERIALS AND PROCESSES FOR THEIR PREPARATION

Wilhelm Goyert, Cologne; Wolfgang Grimm, Leverkusen; Albert Awater, Odenthal; Hans Wagner, Dormagen, and Bruno Krüger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 103,003, Dec. 13, 1979, abandoned. This application Jun. 1, 1984, Ser. No. 616,452

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854406

Int. Cl.³ C08K *3/40;* **C08L** *75/04, 55/02*

U.S. Cl. 524—494 **20 Claims**

1. Thermoplastic chemical material comprising

(A) from 60 to 97%, by weight, based on (A)+(B), of a thermoplastic polyurethane; and

(B) from 40 to 3%, by weight, based on (A)+(B), of glass fiber reinforcing material; and

(C) from 36 to 3 parts, by weight, based on 100 parts of (A)+(B), of a polar polymer containing at least 30% by weight of butadiene, isoprene and/or acrylic acid ester units which is a graft polymer having a rubbery polymer backbone containing butadiene, isoprene and/or acrylic ester units and grafted polar monomer selected from the group consisting of acrylic acid alkyl esters, methacrylic acid alkyl ester and/or acrylonitrile, styrene, α-methyl styrene and mixtures thereof in which the proportion, by weight of graft polymer backbone to graft monomer is in the range from 50:50 to 95:5.

4,500,672

RUBBER COMPOSITION COMPRISING FURNACE CARBON BLACK

Hiroaki Suzuki, and Shinji Misono, both of Aichi, Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 548,128

Claims priority, application Japan, Oct. 11, 1982, 57-196022

Int. Cl.³ C08K *3/04*

U.S. Cl. 524—496 **5 Claims**

1. A rubber composition prepared by compounding 100 parts by weight of a rubber component with 25 to 250 parts by weight of carbon black which belongs to a furnace carbon black having the property range of an electron-microscopic average particle diameter (dn) of above 31 millimicron, an iodine adsorption number of 35 to 60 mg/g, and a dibutyl phthalate absorption number (DBP) of 90 to 150 ml/100 g, and which has a selected property in that the Dst mode diameter (mμ) is below the value obtained from the following equation:

$$Dst = 2.65 \times dn + 0.64 \times DBP - 27.56.$$

4,500,673

VINYLIDENE CHLORIDE AND STYRENE-CONTAINING COPOLYMER LATICES

James E. Devona, Mount Prospect, and Martin L. Essigmann, Palatine, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 21, 1983, Ser. No. 553,566

Int. Cl.³ C08L *39/00*

U.S. Cl. 524—548 **8 Claims**

1. An aqueous latex comprising an aqueous emulsion copolymer of monomers consisting essentially of from 10% to 30% of vinylidene chloride together with a mixture of 20% to about 50% of styrene, and from 40% to 60% of monoethylenic ester, said mixture of monomers providing the copolymer with a glass transition temperature in the range of −10° C. to +10° C., and from about 0% to 10.0% of a monomer promoting adhesion, said proportions being based on the total weight of monomers copolymerized.

4,500,674

HIGH TEMPERATURE POLYMER CONCRETE COMPOSITIONS

Jack J. Fontana, and Walter Reams, both of Shirley, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 29, 1984, Ser. No. 614,508
Int. Cl.[3] C04B 7/02; C08K 3/34
U.S. Cl. 524—650 5 Claims

1. A composition for preparing a polymer concrete consisting of two components, (a) Component A, the aggregate, consisting essentially of silica sand, silica flour, and portland cement in the following concentrations:

Silica sand	60–77	wt. %
Silica flour	5–10	wt. %
Portland cement	15–20	wt. %
Acrylamide	1–5	wt. %

and (b) Component B, the monomer system, consisting essentially of styrene and trimethylolpropane trimethacrylate in the following concentrations:

Styrene	50–60 wt. %
Trimethylolpropane trimethacrylate	35–40 wt. %

and necessary initiators, accelerators, and surfactants.

4,500,675

STABLE DISPERSIONS OF POLYMERS IN POLYFUNCTIONAL COMPOUNDS HAVING A PLURALITY OF ACTIVE HYDROGENS

Thomas E. Fisk, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1983, Ser. No. 472,533
Int. Cl.[3] C08K 5/05, 5/06; C08J 3/08; C08L 75/04
U.S. Cl. 524—762 11 Claims

1. a stable improved copolymer dispersion which comprises:
(A) a polyahl having dispersed therein;
(B) an addition copolymerizate of (1) a monomeric adduct of (a) an active ethylenically unsaturated N-(halosulfonyl)-carbamyl monomer or an active ethylenically unsaturated N-(halocarbonyl)carbamyl monomer and (b) a monoahl or a polyahl with (2) at least one other ethylenically unsaturated monomer; or
(C) (1) an addition copolymer of a carbamyl monomer with at least one other ethylenically unsaturated monomer and (2) a monoahl or polyahl; or
(D) a mixture of (B) and (C); or
(E) a mixture of (B) and/or (C) and a polymer of at least one other ethylenically unsaturated monomer;
provided that in the copolymer dispersion, the mole ratio of polymerized carbamyl monomer to monoahl or polyahl is at least about 0.001:1 and less than an amount at which gelation occurs.

4,500,676

HYALURONATE MODIFIED POLYMERIC ARTICLES

Endre A. Balazs, Riverdale, and Adolf Leshchiner, Brooklyn, both of N.Y., assignors to Biomatrix, Inc., Ridgefield, N.J.

Filed Dec. 15, 1983, Ser. No. 561,816
Int. Cl.[3] C08F 8/00
U.S. Cl. 525—54.2 23 Claims

1. A composition of matter comprising a polymeric material modified by the inclusion therein of hyaluronic acid or a salt thereof.

4,500,677

RESIN COMPOSITION EXCELLENT IN DRAWABILITY

Yoshitsugu Maruhashi; Fumio Kano, both of Yokohama; Muneki Yamada, Fujisawa, and Sadao Hirata, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,757
Claims priority, application Japan, Jan. 29, 1982, 57-11741
Int. Cl.[3] C08L 23/08, 29/04, 77/00
U.S. Cl. 525—57 9 Claims

1. A resin composition excellent in the drawability, which comprises (A) a saponified ethylene-vinyl ester copolymer having an ethylene content of 20 to 55 mole % and a saponification degree of at least 95%, (B) a saponified ethylene-vinyl ester copolymer having an ethylene content of 25 to 60 mole % and a saponification degree of at least 90%, the ethylene content of the saponified copolymer (B) being higher by at least 3 mole % than the ethylene content of the saponified copolymer (A), and (C) a polyamide having a film-forming molecular weight, wherein the weight ratio of the saponified copolymer (A) to the saponified copolymer (B) is in the range of from 90/10 to 10/90 and the weight ratio of the sum of the saponified copolymers (A) and (B) to the polyamide (C) is in the range of from 95/5 to 5/95.

4,500,678

LUBRICANT COMPRISING A PARTIALLY DEFLUORINATED GRAPHITE FLUORIDE

Yasushi Kita; Shirou Morol; Akira Sakanoue, and Hisaji Nakano, all of Ube, Japan, assignors to Central Glass Co., Ltd., Yamaguchiken, Japan

Filed Jul. 18, 1983, Ser. No. 514,792
Claims priority, application Japan, Jul. 19, 1982, 57-125370
Int. Cl.[3] C10M 7/04, 1/10
U.S. Cl. 252—58 14 Claims

1. A lubricant comprising a partially defluorinated graphite fluoride obtained by a process comprising dispersing a graphite fluoride in a dispersion medium to obtain a dispersion, exposing the dispersion to electromagnetic radiation to effect partial degradation of the graphite fluoride in the dispersion so that the fluorine atoms in the graphite fluoride are partially removed, and separating the resulting partially degraded graphite fluoride from the dispersion.

4,500,679

POLYBLENDS OF THERMOPLASTIC COPOLYETHERESTERS STYRENE-MALEIC ANHYDRIDE POLYMERS, AND ACRYLONITRILE-BUTADIENE-STYRENE POLYMERS

Daniel L. DuFour, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 9, 1982, Ser. No. 406,407
Int. Cl.[3] C08L 67/02, 51/04, 55/02
U.S. Cl. 525—64 15 Claims

1. A polyblend consisting essentially of:
A. from 3 to 90% by weight of a thermoplastic copolyether-ester elastomer;
B. from 5 to 70% by weight of a polymer of a vinylaromatic monomer and an unsaturated dicarboxylic acid anhydride monomer and optionally a termonomer, selected from the group consisting of C_1 to C_3 acrylates and methacrylates and unsaturated nitriles, wherein the relative amounts by weight of the monomers in the polymer are 50 to 85% of the vinylaromatic monomer, 15 to 35% of the dicarboxylic acid anhydride and 0 to 20% of the termonomer; and wherein the monomers are polymerized in the presence of 0 to 25% by weight of a rubber having a glass transition temperature below 0° C.; and
C. from 5 to 70% by weight of a grafted polymer composition comprising a graft polymer of from 20 to 40 parts by weight of a monomer selected from the group consisting of methyl methacrylate and acrylonitrile and 80 to 60

parts by weight of a vinyl aromatic monomer, the polymer being grafted onto a substrate rubber having a glass transition temperature below 0° C. wherein the monomers are polymerized in the presence of and grafted onto the substrate rubber, wherein the weight percent of the rubber is in the range from 5 to 60% by weight based on the weight of the composition;

and wherein the weight percent for Components (A), (B) and (C) is based on the total amount of Components (A), (B) and (C) in the polyblend.

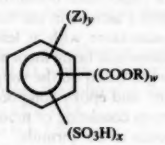
4,500,680

AROMATIC ACID CATALYSTS PROVIDING IMPROVED HUMIDITY RESISTANCE

Debra L. Singer, Pittsburgh; Gregory J. McCollum, Glenshaw; Rostyslaw Dowbenko, and James B. O'Dwyer, both of Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 14, 1983, Ser. No. 551,389
Int. Cl.³ C08L *61/20, 67/00, 75/00*
U.S. Cl. 525—143 **12 Claims**

1. In a curable composition comprising an active hydrogen-containing resin which is essentially free of glycidyl groups, a curing agent present externally and/or internally as a part of the active hydrogen-containing resin, and an acid catalyst, wherein the improvement comprises using as the acid catalyst a catalytic amount of a sulfonic acid having a molecular weight of less than 500 and represented by the following structural formula:



wherein:

Z is a radical independently selected from C_1 to C_{20} alkyl, C_3 to C_{20} cylcoalkyl, C_6 to C_{18} aryl, halogen, alkoxy, hydroxyl, and aryloxy;

R is independently selected from C_1 to C_{20} alkyl, C_3 to C_{20} cycloalkyl and C_6 to C_{18} aryl;

y is an integer from 0 to 4;

w is an integer from 0 to 2;

x is an integer from 1 to 3, with the proviso that when w is 0, y is an integer from 1 to 4 and x is an integer from 2 to 3 and when y is 0, w is an integer from 1 to 2 and x is an integer from 1 to 2.

4,500,681

THERMOPLASTIC BLEND OF POLYOLEFIN, ISOBUTYLENE-BACKBONE ELASTOMER AND ETHYLENE COPOLYMER

Cindy B. Shulman, Cliffside Park, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 27, 1982, Ser. No. 453,727
Int. Cl.³ C08L *23/22, 23/10, 31/04, 33/08*
U.S. Cl. 525—222 **23 Claims**

1. A thermoplastic elastomeric blend composition comprising:

(a) from about 20 to about 65 weight percent isotactic polypropylene or polypropylene reactor copolymer containing about 1 to about 20 weight percent of an alpha-olefin comonomer or mixtures thereof,

(b) from about 20 to about 60 weight percent of an isobutylene-backbone elastomer component, and

(c) from about 7 to about 40 weight percent of a copolymer component of ethylene and an unsaturated ester of a lower carboxylic acid.

4,500,682

HIGH MELT-VISCOELASTIC POLYPROPYLENE FOR POST-PROCESSED SHEETS AND FOR BLOW MOLDING

Hiromasa Chiba; Kenjiro Obama; Shunji Kawazoe; Takahiro Oka, and Akihiro Sato, all of Chibaken, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed May 18, 1983, Ser. No. 495,655
Claims priority, application Japan, May 19, 1982, 57-84447
Int. Cl.³ C08L *23/12, 23/16*
U.S. Cl. 525—240 **4 Claims**

1. A polypropylene for post-processed sheets and for blow molding which is characterized in that

(1) said polypropylene is obtained by polymerizing propylene at multiple stages by the use of a catalyst comprising a titanium trichloride composition and an organoaluminum compound and a molecular weight modifier;

(2) the resulting final polymer comprising a higher molecular weight portion and a lower molecular weight portion has a melt flow index (MI) of 0.03 to 2.0 g/10 minutes, and between this melt flow index and a melt flow index (HMI) (10.2 kg/10 minutes, 230° C.) as measured under 5 times the load applied in the measurement of the former melt flow index, there is a relationship

$$\log HMI \geqq 0.922 \log MI + 1.44 \quad (1);$$ and

(3) said final polymer consists of 40 to 60% by weight of a polypropylene portion corresponding to said higher molecular weight portion and 60 to 40% by weight of a polypropylene portion corresponnding to said lower molecular weight portion, the intrinsic viscosity of the higher molecular weight portion, $[\eta]_H$, and that of the lower molecular weight portion N_L, having the relationship: $3.0 \leqq [\eta]_H - [\eta]_L \leqq 6.5$.

4,500,683

PRESSURE-SENSITIVE ADHESIVE COMPOSITION

Yutaka Hori; Makoto Sunakawa; Kikuo Takayama; Naoki Matsuoka, and Yutaka Moroishi, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 177,046, Aug. 11, 1980, abandoned. This application Jun. 8, 1984, Ser. No. 618,329
Claims priority, application Japan, Aug. 11, 1979, 54-102532
Int. Cl.³ C08L *51/04, 33/08, 33/10*
U.S. Cl. 524—533 **17 Claims**

1. A pressure-sensitive adhesive composition containing as a polymer component an addition-polymerization polymer of an acrylate or methacrylate polymer having sticking properties at room temperature and one or more ethylenically unsaturated monomers capable of forming a homo- or co-polymer having a glass transition point of at least 273° K., said addition-polymerization polymer being produced by polymerizing one or more ethylenically unsaturated monomers in the presence of the acrylate or methacrylate polymer having sticking properties at room temperature, wherein the ethylenically unsaturated monomer is selected from at least one member of the group consisting of (a) styrene and a styrene derivative, (b) vinyl acetate, (c) acrylonitrile, (d) methacrylonitrile, (e) an acrylate derivative, and (f) a methacrylate derivative, each being capable of forming a homopolymer having a glass transition point of at least 273° K.

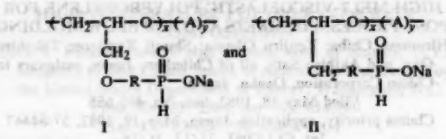
4,500,684

HYDROPHOSPHONYLATED DERIVATIVES OF GLYCIDYL ETHER POLYMERS

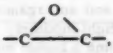
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 30, 1983, Ser. No. 567,287
Int. Cl.³ C08F *8/42*
U.S. Cl. 525—327.3 **6 Claims**

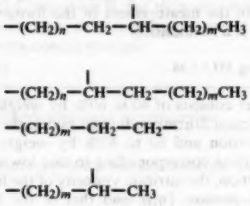
1. A water soluble hydrophosphonylated polymeric compound having the structure selected from the group consisting of:



wherein x ranges from about 5 to about 10^6, y ranges from 0 to about 10^6, A is interpolymerized units of one or more epoxides having the oxirane group



and R is



n is 0 to 19, and m is 0 to 20.

4,500,685

METHOD OF MODIFYING VULCANIZED RUBBER SURFACE WITH HALOGENATING AGENTS

Masaki Ogawa, Kodaira, and Yasuro Shiomura, Higashimurayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 25, 1983, Ser. No. 545,287
Claims priority, application Japan, Oct. 29, 1982, 57-190517
Int. Cl.³ C08F *8/22, 8/20*
U.S. Cl. 525—343 **4 Claims**

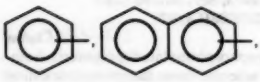
1. A method of modifying a surface of vulcanized rubber, comprising the steps of:

(a) applying a surface modifying composition to the surface of a vulcanized rubber selected from at least one member of the group consisting of natural rubber, polyisoprene rubber, polybutadiene rubber, polychloroprene rubber, styrene-butadiene copolymer rubber, isoprene-butadiene copolymer rubber, isobutylene-isoprene copolymer rubber, ethylene-propylenediene terpolymer rubber, halogenated isobutylene-isoprene copolymer rubber and acrylonitrile-butadiene copolymer rubber, wherein said surface modifying composition comprises:

(i) a halogen-releaseable halogenoid represented by the general formula:

$$R—SO_2NX_2 \text{ or } R'_m—(Ar)—(SO_2NX_2)_n$$

wherein X is a halogen atom, R and R' represent an aliphatic hydrocarbon residue having 1–6 carbon atoms and further R' may be a hydrogen atom or a halogen atom, Ar is a residue selected from the group consisting of:



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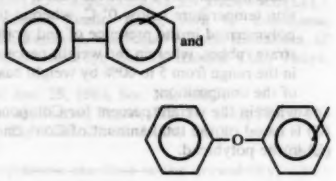


and m and n are an integer of 1–3, respectively, and

(ii) a non-solvent type waxy substance having a melting point of not more than 100° C.;

(b) modifying the thus coated surface of the vulcanized rubber by heating at 60°–150° C.

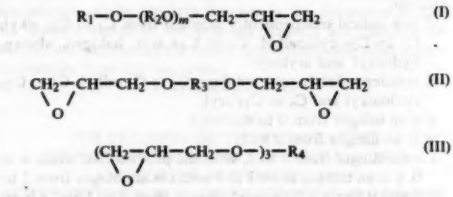
4,500,686

POLYESTER TYPE BLOCK COPOLYMER COMPOSITION

Takuma Kobayashi; Hironobu Kitagawa, and Shigeo Kobayashi, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Mar. 18, 1983, Ser. No. 476,652
Claims priority, application Japan, Mar. 19, 1982, 57-44908
Int. Cl.³ C08L *67/02, 67/04*
U.S. Cl. 525—408 **2 Claims**

1. A polyester type block copolymer which comprises a polyester type block copolymer obtained from a crystalline aromatic polyester and a lactone in the ratio of 95/5 to 30/70 by weight, in melt-admixture with at least one epoxy compound, said epoxy compound being incorporated in an amount of 0.1 to 20% by weight based on the weight of the polyester type block copolymer, said epoxy compound being a member selected from the group consisting of mono-, di- and tri-functional epoxy compounds of the formula:



wherein R_1 is a hydrocarbon group having 1 to 10 carbon atoms, R_2 is an alkylene group having 1 to 4 carbon atoms, R_3 is a divalent hydrocarbon group having 1 to 20 carbon atoms or $—(R_2O)m—R_2—$, R_4 is a trivalent hydrocarbon group having 3 to 20 carbon atoms, and m is an integer of 0 to 20.

4,500,687

ELASTOMERIC POLYETHER-CONTAINING IMPACT POLYMER PRODUCTS

David L. Wolfe, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

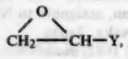
Filed Jun. 18, 1981, Ser. No. 275,071
Int. Cl.³ C08F *283/06*
U.S. Cl. 525—412 **54 Claims**

1. A process to prepare polyether elastomer-modified impact-resistant polymer product(s) comprising the steps of:

(a) at least one major monomer an ethylenically unsaturated, addition-polymerizable monomer which is graft-copolymerizable with epoxy monomers of formula (II) and polyether polymers of such epoxy monomers and

(b) dissolving in said major monomer of step (a) a minor

proportion of at least one monomer copolymerizable with the major monomer of the formula:



(II)

wherein Y is R_1 or CH_2OR_2; R_1 is H, an aliphatic hydrocarbyl group of 1 to about 20 carbon atoms, a chloromethyl or a bromomethyl group; and R_2 is is with or without ethylenic unsaturated a acyl residue of a carboxylic acid containing from 1 to about 30 carbon atoms or a hydrocarbyl group of from 1 to about 20 carbon atoms which may bear other inert substituents; and at some point from said step (a) to after completion of said step (b);

(c) adding to the monomer a catalytically effective quantity of a coordination catalyst for polymerization of monomers of the formula (II) the catalyst comprising the product of contacting:

(i) component A which is a compound of the formula:

RR'AlX, (III)

wherein R and R' each independently are an alkyl group of 1 to about 4 carbon atoms and X is hydrogen, an alkyl or alkoxy group of 1 to about 4 carbon atoms;

(ii) component B, an organic nitrogen-based compound selected from secondary nitrogen-containing compounds that have a basicity which is about equal to or less than the basicity of dimethylamine and no active hydrogen atoms therein other than those of the secondary nitrogen;

(iii) component C, a β-diketone; and

(iv) component D which is water the contacting being done employing the following molar ratios:

B:A—about 0.01–2.5:1

C:A—about 0.1–1.5:1

D:A—about 0.1–1.2:1

all provided that when the molar ratio sum of (C+2D):A is greater than about 3:1, then the B:A molar ratio must at least be about 1:1;

(d) polymerizing the monomer of the formula (II) until at least a portion of said formula (II) monomer are converted and pre-formed in situ in a reaction mixture of the components (a), (b) and (c), to a polyether;

(e) deactivating any unconsumed catalyst in said reaction mixture by addition of an active hydrogen atom containing compound; after any one of the steps (d), (f) and (g);

(f) subjecting the said major monomer defined in (a) to addition polymerization in said reaction mixture until at least a portion of the major monomer is converted to polymer and graft-polymers with said pre-formed polyether in said reaction mixture; and

(g) removing from said reaction mixture, a polyether elastomer-modified, impact-resistant polymer material.

4,500,688

CURABLE SILICONE CONTAINING COMPOSITIONS AND METHODS OF MAKING SAME

Barry C. Arkles, Oreland, Pa., assignor to Petrarch Systems Inc., Levittown, Pa.

Filed Apr. 20, 1982, Ser. No. 370,000

Int. Cl.³ C08L *59/00, 69/00, 75/06, 77/06*

U.S. Cl. 525—431 **22 Claims**

1. A melt processable composition comprising a silicone component which will be vulcanized by the reaction of a hydride-containing silicone within a polymeric thermoplastic matrix to form a silicone pseudointerpenetrating polymer network, said vulcanization of said silicone component by reaction of said hydride-containing silicone being initiated during thermoplastic melt-mixing of said component with said matrix.

4,500,689

LOW COST POLYESTER MODIFIED PHENOLIC RESIN CONTAINING A COMBINATION OF LONG AND SHORT CHAIN ALKYLPHENOLS

Charles H. Thomas, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1983, Ser. No. 567,449

Int. Cl.³ C08L *67/08*

U.S. Cl. 525—442 **8 Claims**

1. A resinous insulating solution comprising:

(A) polyester resin solution, and

(B) a solution of a reaction product of a combination of:

(1) long chain alkyl phenol, where alkyl contains from 8 to 10 carbon atoms, combined with short chain alkyl phenol, where alkyl contains from 3 to 6 carbon atoms, where the combination contains from about 20 wt.% to about 75 wt.% of long chain alkyl phenol,

(2) crosslinking agent selected from the group consisting of cresylic acid, phenol, and mixtures thereof,

(3) aldehyde, and

(4) alkali catalyst, where polyester resin solids comprise from about 25 solids weight percent to about 75 solids weight percent of the insulating solution.

4,500,690

THERMOSETTING POLYMERS FROM AROMATIC ALDEHYDES, AZINES AND ISOPROPENYL PHENOLS

Randy J. LaTulip, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 11, 1984, Ser. No. 609,156

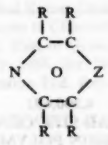
Int. Cl.³ C08G *14/06, 14/12*

U.S. Cl. 525—502 **10 Claims**

1. A thermosetting prepolymer which comprises the resinous reaction product of

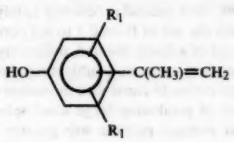
(A) one or more aromatic dialdehydes,

(B) one or more azine compounds having the formula



where Z is N, C—CH_3, or C—CH_2—CH_3, or C—H R is hydrogen, methyl, or ethyl, whereby the total number of methyl groups substituted on the ring is in the range from 2–4, and

(C) a member of the group consisting of (1) monomeric para or meta ispropenyl phenols having the formula



wherein R_1 is hydrogen, or a group inert to the polymerization reaction, (2) dimers of said phenols, and (3) mixtures thereof.

4,500,691

PHENOL-NOVOLAKS CONTAINING AMINO GROUPS

Friedrich Stockinger, Hölstein, and Theobald Haug, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 6, 1984, Ser. No. 568,685

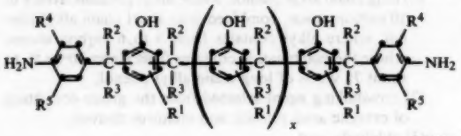
Claims priority, application Switzerland, Jan. 13, 1983, 173/83

Int. Cl.³ C08L *61/14, 61/16;* C08G *8/16, 8/28*

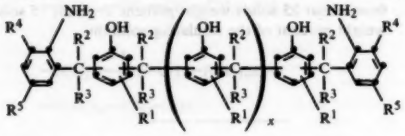
U.S. Cl. 525—503 3 Claims

1. A phenol-novolak, containing amino groups, having the formula VI or VII

(VI)



(VII)



in which R^1 is bonded in the o- or position relative to the phenolic OH group and is a halogen atom, a nitro group, linear or branched alkyl having not more than 6 C atoms, alkoxy having not more than 6 C atoms or phenyl, R^2 is a hydrogen atom, linear or branched alkyl having not more than 8 C atoms, cycloalkyl having 5 or 6 C atoms, phenyl or furfuryl, R^3 is a hydrogen atom or linear or branched alkyl having not more than 8 C atoms, R^4 and R^5 independently of one another are each linear or branched alkyl which has not more than 6 C atoms in the alkyl radical and is unsubstituted or substituted by halogen atoms, nitro or cyano groups or alkoxy having not more than 4 C atoms, or a halogen atom or a nitro or cyano group, and x has an average value from 1 to 8.

4,500,692

PROCESS FOR BEAD SIZE CONTROL IN VINYL AROMATIC SUSPENSION POLYMERIZATION USING SODIUM POLYSTYRENESULPHONATE

Harold A. Wright, Murrysville, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 13, 1982, Ser. No. 417,306

Int. Cl.³ C08F *2/20*

U.S. Cl. 526—201 9 Claims

1. In a process for producing polymer beads from a vinyl aromatic monomer, by suspending the monomer containing a monomer-soluble, free radical-producing catalyst in an aqueous medium, with the aid of from 0.1 to 4.0 percent by weight based on monomer of a finely divided, difficultly water-soluble phosphate suspending agent and subjecting the suspension to an elevated temperature to cause said monomer to polymerize; the improvement of producing large sized spherical polymer beads having an average particle size greater than 1000 microns and having a narrow distribution of bead diameter sizes which consists of adding to said suspension between 0.0001 to 0.0040 percent by weight, based on monomer, of a sodium polystyrenesulfonate.

4,500,693

WATER SOLUBLE COPOLYMER METHOD FOR MANUFACTURE THEREFORE AND USE THEREOF

Hidetoshi Takehara, Tatsuno; Shorbu Shioji, and Yohichi Nakagawa, both of Himeji, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

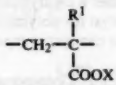
Continuation of Ser. No. 395,883, Jul. 7, 1982, abandoned. This application May 25, 1984, Ser. No. 614,695

Claims priority, application Japan, Jul. 7, 1981, 56-105027; Jul. 8, 1981, 56-105635; Feb. 26, 1982, 57-28863; Mar. 9, 1982, 57-35854

Int. Cl.³ C08F *220/04*

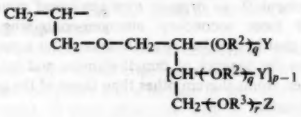
U.S. Cl. 526—240 22 Claims

1. A water-soluble copolymer, comprising 50 to 99.5 mol% of repeating units represented by the general formula I:



(I)

wherein R^1 denotes A hydrogen atom or methyl group and X a hydrogen atom, alkali metal atom, alkaline earth metal atom, ammonium group or organic amine group, and 50 to 0.5 mol% of repeating units represented by the general formula II:



(II)

wherein, p denotes an integer of the value of 1 to 4, q and r independently denote O or an integer of the value of 1 to 100, R^2 and R^3 independently denote an alkylene group of 2 to 4 carbon atoms, Y denotes a hydroxyl group, and Z denotes a monovalent sulfonic acid group or an alkali metal salt thereof.

4,500,694

OPTICAL MATERIALS

Akira Ohmori, Ibaraki; Nobuyuki Tomihashi, Takatsuki, and Takahiro Kitahara, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Japan

Filed May 3, 1983, Ser. No. 491,234

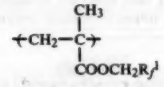
Claims priority, application Japan, May 7, 1982, 57-76936

Int. Cl.³ C08F *214/18*

U.S. Cl. 526—245 5 Claims

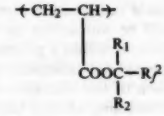
1. An optical material comprising a thermal resisting fluoroalkylmethacrylate copolymer which essentially consists of:

(a) about 70 to about 99 mol % of fluorine-containing methacrylate monomer unit of the formula



wherein R_f^1 represents a fluoroalkyl group having 1 to 3 carbon atoms and

(b) about 1 to about 30 mol % of a fluorine-containing acrylate monomer unit of the formula



wherein R_1 and R_2 are the same or different and represents a hydrogen atom or a lower alkyl group and R_f represents a fluoroalkyl group having 1 to 3 carbon atoms.

4,500,695

SILICONE-VINYL ACETATE COMPOSITION FOR CONTACT LENSES

Edward J. Ivani, 2360 E. 74th St., Brooklyn, N.Y. 11234

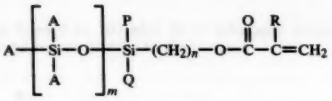
Continuation-in-part of Ser. No. 322,266, Nov. 17, 1981, Pat. No. 4,410,674. This application Jun. 13, 1983, Ser. No. 503,904

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.³ C02C *7/04*; C08F *218/08, 230/08*

U.S. Cl. 526—279 **8 Claims**

1. A composition specially adapted for the manufacturing of contact lenses having increased oxygen permeability, consisting essentially of a copolymer of comonomers consisting of about 2–98 parts by weight of a vinyl siloxane monomer copolymerized with 98–2 parts by weight of vinyl acetate, the vinyl siloxane monomer being a polysiloxanylalkyl ester having as its structure:



wherein P and Q are selected from the group consisting of (C_1–C_7) alkyl, phenyl and Z groups; Z is

wherein A is selected from the group consisting of (C_1–C_7) alkyl and phenyl groups; R is selected from the group consisting of methyl, ethyl, and butyl groups and hydrogen; m and n are integers of at least 1 and less than 8.

8. As a new article of manufacture, a contact lens having an increased oxygen permeability, consisting essentially of the compositions of claim 1 or 2.

4,500,696

POWDER SURFACE COATINGS

Rainer Gras, Bochum, Fed. Rep. of Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

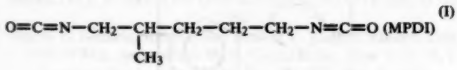
Filed Jun. 19, 1984, Ser. No. 622,178

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322719

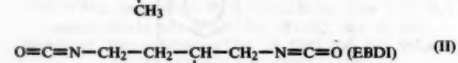
Int. Cl.³ C08G *18/80*

U.S. Cl. 528—45 **14 Claims**

1. Powder surface coatings comprising polyols and a polyisocyanate component, wherein said polyisocyanate component comprises blocked adducts of 2-methyl-1,5-pentanediisocyanate, 2-ethyl-1,4-butanediisocyanate or a mixture thereof according to formulas (I) and (II):



(I)



(II)

wherein the diisocyanate mixture of (I) and (II) has about 88 to 99% by weight of (I) and about 12 to 1% by weight of (II), and wherein the latent NCO content of said blocked adducts is about 7 to 18% by weight, and the free NCO content is less than or equal to 2% by weight.

4,500,697

MIXTURE OF SUBSTANCES SUITABLE FOR USE AS A POWDER VARNISH OR BINDER FOR POWDER VARNISHES

Josef Disteldorf, Herne, and Rainer Gras, Bochum, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

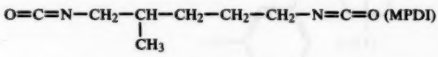
Filed Jun. 19, 1984, Ser. No. 622,180

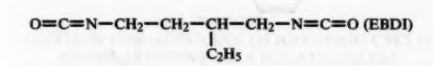
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322718

Int. Cl.³ C08G *18/80*

U.S. Cl. 528—45 **12 Claims**

1. A mixture of substances suitable as a powder varnish or a binder for powder varnishes consisting essentially of an isocyanate component with partially or totally blocked isocyanate groups, and a polyhydroxyl component, wherein mixed trimers or mixtures of individual trimers are used as the isocyanate component from a mixture consisting essentially of 2-methyl-1,5-diisocyanatopentane (MPDI) and 2-ethyl-1,4-diisocyanatobutane (EBDI) having the formulas:





in the amounts of about 88 to 99% by weight of (MPDI) and about 12 to 1% by weight of (EBDI), in combination with 3-isocyanato-3,5,5-trimethyl-cyclohexylisocyanate (IPDI) or mixed urethane adducts or a mixture of individual urethane adducts obtained from the reaction of the MPDI/EBDI mixture in combination with IPDI with diols or triols or a mixture thereof.

4,500,698

ONE-COMPONENT BAKING ENAMELS

Josef Disteldorf, Herne, and Rainer Gras, Bochum, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

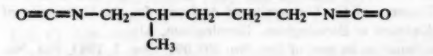
Filed Jun. 19, 1984, Ser. No. 622,196

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322721

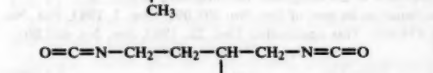
Int. Cl.³ C08G *18/80*

U.S. Cl. 528—45 **11 Claims**

1. One-component baking enamels comprising polyesters, which contain hydroxyl groups, and a polyisocyanate component, wherein the polyisocyanate component is a totally or partially blocked adduct or adducts of a mixture of 2-methyl-1,5-diisocyanatopentane (I) and 2-ethyl-1,4-diisocyanatobutane (II) according to the formulas (I) and (II):



(I)



(II)

wherein said mixture of diisocyanates comprises about 88 to 99% by weight of totally or partially blocked 2-methyl-1,5-diisocyanatopentane and about 12 to 1% by weight of totally or partially 2-ethyl-1,4-diisocyanatobutane.

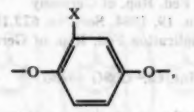
4,500,699

OPTICALLY ANISOTROPIC MELT FORMING COPOLYESTERS

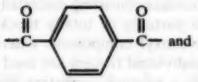
Robert S. Irwin, Wilmington, and Francis M. Logullo, Sr., Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 26, 1984, Ser. No. 624,829
Int. Cl.³ C08G *63/18*
U.S. Cl. 528—128 **8 Claims**

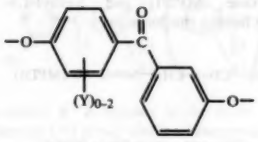
1. A copolyester consisting essentially of Units I, II and III, said units having the structural formulas:



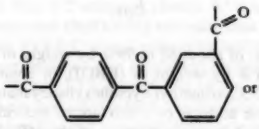
I

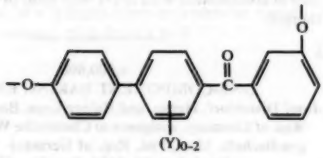


II



III





where X is chloro, bromo, methyl, ethyl or phenyl, and Y is chloro or methyl with the proviso that Y substituents are not in both 2' and 6' positions; in the proportions of from about 30 to 50 mol % of Unit I, from about 30 to 50 mol % of Unit II and from about 10 to 20 mol % of Unit III.

4,500,700

ELASTOMERIC COMPOSITE MATERIAL COMPRISING A POLYPENTAPEPTIDE HAVING AN AMINO ACID OF OPPOSITE CHIRALITY IN POSITION THREE

Dan W. Urry, Birmingham, Ala., assignor to The Board of Trustees of the University of Alabama for the University of Alabama in Birmingham, Birmingham, Ala.

Continuation-in-part of Ser. No. 308,091, Oct. 2, 1981, Pat. No. 4,474,851. This application Dec. 23, 1982, Ser. No. 452,801
Int. Cl.³ C08G *69/10*
U.S. Cl. 528—328 **9 Claims**

1. An elastomeric material, comprising:

an elastomeric polypeptide, wherein said polypeptide comprises pentapeptide repeating units consisting of a first amino carboxylic acid residue, a second amino carboxylic acid residue, a third amino carboxylic acid residue, a fourth amino carboxylic acid residue and a fifth amino carboxylic acid residue, wherein said repeating units comprise amino carboxylic acid residues selected from the group consisting of hydrophobic amino carboxylic acid and glycine residues wherein said residues are amino carboxylic acids which are missing a hydrogen of an amino group and a hydroxyl of a carboxyl group, wherein the third amino carboxylic acid residue of at least one repeating unit of said polypeptide has a D configuration if the first, second, fourth and fifth hydrophobic amino carboxylic acid residues which are not glycine residues have the L configuration or the L configuration if the first, second, fourth and fifth hydrophobic amino carboxylic acid residues which are not glycine residues have the D configuration and wherein said repeating units exist in a conformation having a β-turn.

4,500,701

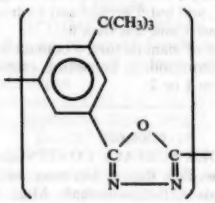
CO-POLYOXADIAZOLES BASED ON 5-T-BUTYLISOSPHTHALIC ACID

James R. Stephens, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 424,607, Sep. 27, 1982, abandoned. This application Dec. 19, 1983, Ser. No. 563,294
Int. Cl.³ C08G *73/08*
U.S. Cl. 528—363 **42 Claims**

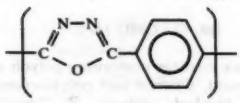
1. A moldable copolyoxadiazole comprising the following structure:

(A)



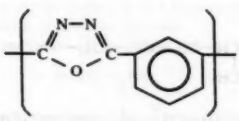
and

(B)



and

(C)



wherein the ratio A units to a mixture of B units and C units is about 1:99 to about 99:1 and the ratio of B units to C units is about 1:99 to about 99:1.

4,500,702

ANHYDROUS PREPARATION OF POLYARYLENE SULFIDE IN ONE VESSEL REACTION SYSTEM

Edgar Ostlinning, Duesseldorf, and Karsten Idel, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 550,871

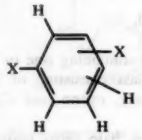
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243189

Int. Cl.³ C08G 75/14

U.S. Cl. 528—388 13 Claims

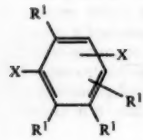
1. A process for the production of high molecular weight polyarylene sulphide under anhydrous conditions from

(a) 100 to 0 Mol % of dihalogen aromatic compound corresponding to the formula



(I)

and from 0 to 100 Mol % of dihalogen aromatic compound corresponding to the formula



(II)

wherein

X represents meta- or para-positioned chlorine or bromine relative to each other, and

R^1 is the same or different and represents hydrogen, alkyl, cyloalkyl, aryl, alkylaryl, arylalkyl, and two orthopositioned radicals R^1 relative to each other are linked together through a N, O or S atom to form an aromatic ring or linked together through a N, O or S atom to form a heterocyclic ring, and one R^1 is different from hydrogen, and from 0 to 5 mol %, based on the total of components (a) and (b), of a tri- or tetra-halogen aromatic compound corresponding to the formula

$$ArX_n \quad \text{(III)},$$

wherein

Ar represents an aromatic or heterocyclic radical,

X represents chlorine or bromine, and

n represents 3 or 4, and

(c) at least one alkali sulphide the molar ratio of (a+b):c ranging from 0.85 to 1.15:1, and

(d) an organic solvent with the molar ratio of alkali sulphide (c) and organic solvent (d) ranging from 1:2 to 1:15, and wherein the process is conducted in a one-vessel reaction and water which distills off azeotropically is removed from the reaction mixture.

4,500,703

REACTIVE ADHESIVE DISPERSION AND METHOD OF USE

James L. Guthrie, Ashton, and Ronald T. Wojcik, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 481,802, Apr. 4, 1983, abandoned. This application Dec. 28, 1983, Ser. No. 566,414

Int. Cl.³ C08G 59/50; C08L 63/02

U.S. Cl. 523—400 11 Claims

1. A one part, storage stable, thermosettable, heat reactive, adhesive composition comprising an insoluble dispersion of a solid epoxy resin containing more than one epoxy group and a solid, sterically unhindered, tertiary amine catalyst in a liquid vehicle in which said solids are at least partially soluble when melted.

4,500,704

CARBON DIOXIDE OXIRANE COPOLYMERS PREPARED USING DOUBLE METAL CYANIDE COMPLEXES

William J. Kruper, Jr., and Daniel J. Swart, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 15, 1983, Ser. No. 523,217

Int. Cl.³ C08G 63/62

U.S. Cl. 528—405 22 Claims

1. A process for the preparation of a carbon dioxide oxirane copolymer wherein the process comprises contacting carbon dioxide with an oxirane in the presence of (1) an organic coordination compound and (2) a catalytic amount of a double metal cyanide complex under conditions such that an oxirane carbon dioxide copolymer is prepared.

4,500,705

METHOD FOR REDUCING OLIGOMERIC CYCLIC ETHER CONTENT OF A POLYMERIZATE

Harry B. Copelin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 9, 1984, Ser. No. 569,572

Int. Cl.³ C08J 3/00; C07C 43/11

U.S. Cl. 528—417 3 Claims

1. A method for reducing the oligomeric cyclic ether content of a tetrahydrofuran-, an alkylene oxide-, or a tetrahydrofuran/alkylene oxide polymerizate, the method comprising bringing the polymerizate into contact with an aliphatic- or cycloaliphatic hydrocarbon of 6–8 carbon atoms, or an aliphatic- or cycloaliphatic hydrocarbon of 6–8 carbon atoms substituted with one or more methyl or ethyl groups, for a time sufficient to bring the oligomeric cyclic ether content of the polymerizate to the desired level, and then separating the polymerizate and the hydrocarbon.

4,500,706

METHOD OF PRODUCING EXTRUSION GRADE POLY(ARYLENE SULFIDE)

Ronald D. Mathis; Jerry O. Reed, both of Bartlesville, Okla., and Gerald E. Hagler, Simpsonville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 9, 1982, Ser. No. 406,155

Int. Cl.³ C08J 5/00; C08G 75/02

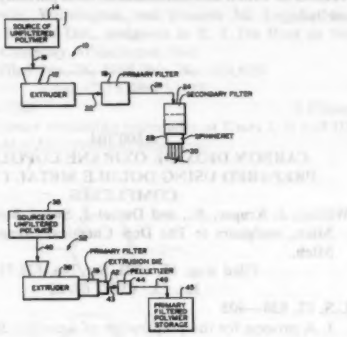
U.S. Cl. 528—502 62 Claims

1. A method of processing a polymer comprising poly(arylene sulfide), comprising the steps of:

forcing molten polymer comprising poly(arylene sulfide) through primary filter means comprising a depth type filter comprising metallurgically bonded metal fibers and having an absolute micron rating in the range from about 45 to about 125 to provide molten primary filtered polymer; and

forcing said molten primary filtered polymer through sec-

ondary filter means having a maximum absolute micron rating of no more than about 80 or a substantially equiva-



lent filtration capability to provide molten secondary filtered polymer.

4,500,707

NUCLEOSIDES USEFUL IN THE PREPARATION OF POLYNUCLEOTIDES

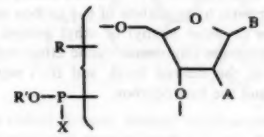
Marvin H. Caruthers, Boulder, Colo., and Mark D. Matteucci, San Francisco, Calif., assignors to University Patents, Inc., Westport, Conn.

Continuation-in-part of Ser. No. 247,144, Mar. 24, 1981, Pat. No. 4,458,066, which is a continuation-in-part of Ser. No. 126,025, Feb. 29, 1980, abandoned. This application Mar. 16, 1982, Ser. No. 358,877

Int. Cl.[3] **C07H** *19/06, 19/10, 19/16, 19/20*

U.S. Cl. 536—27 **16 Claims**

1. A compound of the formula:



wherein B is a nucleoside or deoxynucleoside base; R is H or a blocking group, A is H or OR; R' is a hydrocarbyl radical containing up to 10 carbon atoms and X is a amino group formed by removal of the hydrogen atom from a ring nitrogen of a nitrogen heterocyclic compound which contains unsaturation in the ring structure.

4,500,708

BENZOTHIAZINE DERIVATIVES

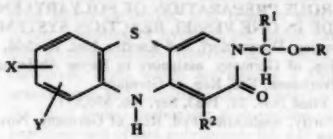
Robert J. Chorvat, Arlington Heights; George R. Lenz, and Suzanne Evans Radak, both of Glenview, all of Ill., assignors to G. D. Serle & Co., Skokie, Ill.

Filed Apr. 23, 1984, Ser. No. 602,782

Int. Cl.[3] **C07D** *513/04*

U.S. Cl. 544—34 **13 Claims**

1. A compound of the formula



wherein

R is hydrogen or a

group wherein R^3 is C_1–C_{15} alkyl;

R^1 is hydrogen or C_1–C_3 alkyl;

R^2 is phenyl or substituted phenyl containing one or two substituents selected from the class consisting of halo, hydroxy, trifluoromethyl, methoxy, cyano and C_1–C_4 alkyl; and

X and Y are independently hydrogen, halo, nitro, trifluoromethyl, amino or C_1–C_4 alkoxy.

4,500,709

THIINYL AND OXOTHIOLYL DERIVATIVES

Takao Takaya, Sakai; Takashi Masugi, Kitamachi; Takashi Ogino, Kobe, and Kiyoshi Tsuji, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

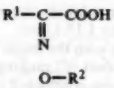
Division of Ser. No. 178,898, Aug. 18, 1980, Pat. No. 4,371,531, which is a division of Ser. No. 916,858, Jun. 19, 1978, Pat. No. 4,242,510, which is a continuation-in-part of Ser. No. 863,923, Dec. 23, 1977, abandoned. This application Sep. 30, 1982, Ser. No. 428,658

Claims priority, application Japan, Dec. 27, 1976, 51-160698; Dec. 5, 1977, 52-146327

Int. Cl.[3] **C07D** *279/10, 327/06, 339/06, 339/08*

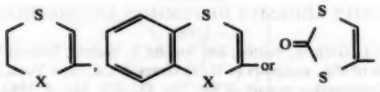
U.S. Cl. 544—58.1 **13 Claims**

1. A compound of the formula:



wherein

R^1 is a group of the formula:



in which X is sulfur, oxygen, imino or lower alkanoyl-substituted imino, and

R^2 is lower alkyl or lower alkenyl, ester thereof, and salt thereof.

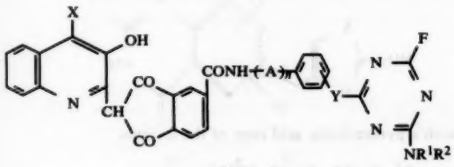
4,500,710

QUINOPHTHALONE DYES FOR CELLULOSE-CONTAINING FIBERS

Toshio Niwa, and Toshio Hihara, both of Kanagawa, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 505,127
Int. Cl.[3] C07D *401/10, 401/14*
U.S. Cl. 544—113 3 Claims

1. A quinophthalone dye for cellulose-containing fibers represented by the following formula:



wherein X represents a hydrogen atom, a chlorine atom or a bromine atom, —A— represents a methylene group, an ethylene group, a propylene group or a 1,3-butylene group, n represents 0 or 1, —Y— represents a linkage group of —O— or —S—, R^1 and R^2 each represents a hydrogen atom, an alkyl or alkenyl group which may optionally be substituted with a cyano group, a hydroxy group, a lower alkoxy group or by a dialkylamino group, or R^1 and R^2 may be combined together with the adjacent nitrogen atom to form a 5- or 6-membered, nitrogen-containing heterocyclic ring having the total carbon atom number in R^1 and R^2 of up to 18.

4,500,711

SYNTHESIS OF LEUCOVORIN

James C. Wisowaty, Chapel Hill; Roy A. Swaringen, Durham, and David A. Yeowell, Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 942,408, Sep. 14, 1978, abandoned, which is a continuation of Ser. No. 779,545, Mar. 21, 1977, abandoned. This application Dec. 22, 1980, Ser. No. 218,554
Int. Cl.[3] C07D *475/04*
U.S. Cl. 544—258 8 Claims

1. The method of preparing calcium leucovorin which comprises the steps of forming a mixture by mixing together anhydroleucovorin, an aqueous solvent, and a sufficient amount of a water soluble organic amine base to bring the pH of the mixture to 5 to 7, heating the mixture at a pH of 5–7 adding to the mixture an amount of a water-soluble calcium salt substantially equimolar to anhydroleucovorin, and isolating calcium leucovorin.

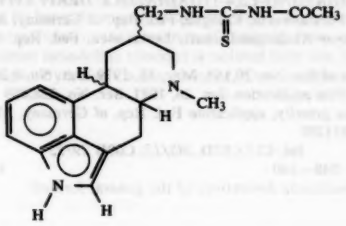
4,500,712

ERGOLINE DERIVATIVES

Luigi Bernardi; Aldemio Temperilli; Daniela Ruggieri; Giuliana Arcari, and Patricia Salvati, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Nov. 1, 1982, Ser. No. 438,259
Claims priority, application United Kingdom, Nov. 6, 1981, 8133631
Int. Cl.[3] C07D *457/04;* A61K *31/48*
U.S. Cl. 546—67 3 Claims

1. The compound 6-methyl-8β-(3-acetylthio-ureidomethyl)-ergoline having the formula:



4,500,713

THERAPEUTIC DIPEPTIDES

John T. Suh, Greenwich, Conn.; Jeffrey N. Barton, New York, and John R. Regan, Mamaroneck, both of N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Sep. 23, 1982, Ser. No. 421,921
Int. Cl.[3] C07D *215/00;* C07C *103/52*
U.S. Cl. 546—165 1 Claim

1. (3S)-2-N-[(1S)-1-Ethoxycarbonyl-1-(2,3-dihydro-1H-inden-2-yl)-methyl]-L-alanyl-1,2,3,4-tetrahydroisoquinoline-3-carboxylic acid.

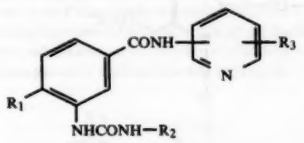
4,500,714

3-SUBSTITUTED-UREIDO-N-PYRIDYL BENZAMIDES

Masamitsu Honda, Tokyo; Hideaki Nagai, Saitama; Shoko Takishima, Tokyo; Akinori Kawamura; Noriko Kawamura, both of Saitama; Takashi Dan, Tokyo; Masuo Koizumi, Tokyo; Yasushi Murakami, Tokyo; Yoshikazu Hinohara, Gunma; Hideki Nakano, Chiba, and Yoshio Takagaki, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1982, Ser. No. 435,541
Claims priority, application Japan, Oct. 15, 1981, 56-163495; Oct. 15, 1981, 56-163496
Int. Cl.[3] C07D *213/75*
U.S. Cl. 546—309 8 Claims

1. A benzamide derivative of the formula:



wherein R_1 is a hydrogen atom, a methyl group or a methoxy group; R_2 is a hydrogen atom, a straight-chain or branched-chain alkyl group having 1 to 6 carbon atoms or a cyclic alkyl group having 5 or 6 carbon atoms or an unsubstituted phenyl group or a phenyl group substituted with a halogen atom, an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms on the nucleus; and R_3 is a hydrogen atom or one or two alkyl groups having 1 to 4 carbon atoms.

4,500,715

2,5-DIAMINO-1,3,4-THIADIAZOLE DERIVATIVES

Hauke Fürstenwerth, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

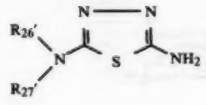
Division of Ser. No. 20,161, Mar. 13, 1979, Pat. No. 4,268,438. This application Jan. 26, 1981, Ser. No. 228,489

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811258

Int. Cl.³ C07D *285/12*; C09B *29/22*

U.S. Cl. 548—140 **1 Claim**

1. Thiadiazole derivatives of the general formula



wherein

R_{26}' denotes a C_1–C_8-alkyl radical which is optionally substituted by hydroxyl, halogen, cyano, C_1–C_4-alkoxy, carboxyl, aminocarbonyl or C_1–C_4-alkoxycarbonyl, a C_2–C_4-alkenyl radical, a cyclohexyl radical which is optionally substituted by C_1–C_4-alkyl, a phenyl, benzyl or phenylethyl radical which is optionally substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, a C_1–C_2-alkylcarbonyl, C_1–C_4-alkoxycarbonyl, mono- or di-C_1–C_4-alkylaminocarbonyl, aminocarbonyl, mono- or di-C_1–C_4-alkylaminosulphonyl, 2-thienyl, 2-furyl, 2-tetrahydrofuryl, amino, C_1–C_4-alkylamino or di-(C_1–C_4-alkyl)-amino radical or a phenylamino or benzylamino radical which is optionally substituted by C_1–C_4-alkyl or C_1–C_4-alkoxy and R_{27}' denotes a C_1–C_8-alkyl radical which is optionally substituted by hydroxyl, halogen, cyano, C_1–C_4-alkoxy, carboxyl, aminocarbonyl- or C_1–C_4-alkoxycarbonyl, a C_2–C_4-alkenyl radical or a benzyl or phenylethyl radical which is substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy.

4,500,716

INTERMEDIATE PRODUCTS FOR THE PREPARATION OF Z-CEPHALOSPORINS

Günther Kinast, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

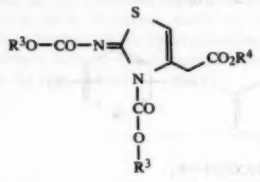
Filed Nov. 1, 1982, Ser. No. 438,189

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145727

Int. Cl.³ C07D *277/48*

U.S. Cl. 548—196 **8 Claims**

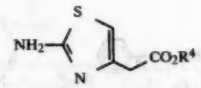
1. A compound of the formula



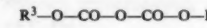
in which

R^3 and R^4 each independently is an optionally substituted alkyl radical with 1 to 15 carbon atoms, an optionally substituted alkenyl radical with 3 to 15 carbon atoms, an optionally substituted cycloalkyl radical with 3 to 10 carbon atoms, an optionally substituted cycloalkenyl radical with 5 to 10 carbon atoms, an optionally substituted carbocyclic aryl radical with 1 to 3 rings or an optionally substituted heterocyclyl radical with 1 to 3 rings which can contain up to 5 heteroatoms selected from nitrogen, sulphur and oxygen, the optional substituents on the alkyl, alkenyl, cycloalkyl and cycloalkenyl radicals being alkyl or alkoxy with 1 to 4 carbon atoms, halogen, optionally substituted phenyl, CN and/or tri-(C_1 to C_5 alkyl)-silyl, the optional substituents on the aryl and heterocyclyl radicals being alkyl, alkoxy, alkylthio and/or alkoxycarbonyl with 1 to 4 carbon atoms per alkyl goup, halogen, phenyl, nitro and/or CN.

5. A process for the production of a compound according to claim 1, comprising reacting a thiazole derivative of the formula



with a pyrocarbonic acid ester of the formula



in a solvent for the reactants.

4,500,717

PROCESS FOR PREPARATION OF 2-OXAZOLIDINONES

Frank T. Cook; Michael O. Nutt, and Hsin H. Hsieh, all of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1983, Ser. No. 479,400

Int. Cl.³ C07D *263/22*

U.S. Cl. 548—229 **15 Claims**

1. A process for the preparation of 2-oxazolidinones which comprises contacting a 2-hydroxyalkyl carbamate with an alkylene carbonate in the presence of a catalytic amount of a quaternary ammonium halide, quaternary phosphonium halide, a group I metal carbonate, hydroxide, oxide or halide, or a group II metal carbonate, hydroxide, oxide or halide under conditions such that a 2-oxazolidinone is prepared.

4,500,718

PROCESS FOR PRODUCING BISMETHINE ISOINDOLINES

Alain C. Rochat, Basel, and Luigi Cassar, Kaiseraugst, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 362,580, Mar. 29, 1982, Pat. No. 4,426,533. This application Sep. 23, 1983, Ser. No. 535,127

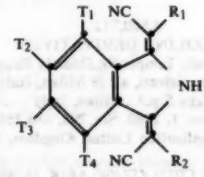
Claims priority, application Switzerland, Apr. 6, 1981, 2338/81

The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.

Int. Cl.³ C09B *57/04*

U.S. Cl. 548—471 **10 Claims**

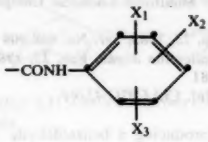
1. A process for producing bismethine isoindolines of the formula

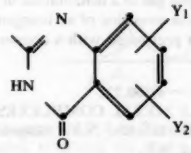


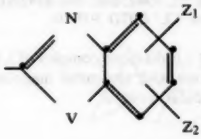
(I)

wherein T_1 to T_4 are hydrogen or halogen, or one or two of the radicals T_1 to T_4 are alkyl, alkoxy or phenoxy, and R_1 and R_2 independently of one another are each cyano, alkyl- or arylcar-

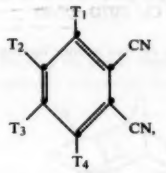
bonyloxy, carbamoyl, alkylcarbamoyl, or radicals of the formulae II to IV


(II)

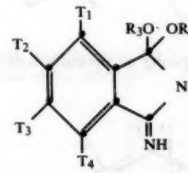

(III)


(IV)

wherein X_1 is a non-solubilising group, and X_2 and X_3 are hydrogen, halogen, alkyl, alkoxy, or alkoxycarbonyl, or together form an —NR′—CO—NR″— group, in which R′ and R″ independently of one another are hydrogen or C_1–C_4-alkyl, and Y_1 and Y_2 are hydrogen, halogen, alkyl or alkoxy, or together form a fused-on benzene ring, V is oxygen, sulfur, imino or alkylimino having 1 to 4 C atoms, and Z_1 and Z_2 have the meanings of Y_1 and Y_2, in which process the condensation of 1 mol of a compound of the formula V, VI or VII or of the salts of VI or VII


(V)

(VI)


(VII)

wherein T_1 to T_4 have the meanings defined above, and R_3 and R_4 are identical or different and are C_1–C_4-alkyl, or together form the group —CH_2—CH_2—, with 2 mols of a cyanomethylene compound of the formula NC—CH_2—R_1 (VIII) or NC—CH_2—R_2 (IX), or with 1 mol of a cyanomethylene compound of the formula VIII and 1 mol of a cyanomethylene compound of the formula IX, wherein R_1 and R_2 have the meanings defined above, is performed in a polar solvent in the presence of a strong base, and the bismethine isoindoline obtained is isolated from the reaction mixture by hydrolysis in the presence of water without acid.

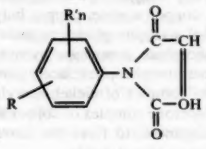
4,500,719

PROCESS FOR THE PREPARATION OF N-ALKENYLPHENYLMALEIMIDES AND N,N′-[ALKENYLENEPHENYLENE]BISMALEMIDES

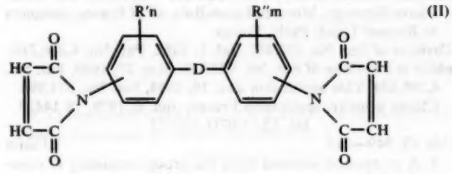
Masayuki Oba, Tokyo; Motoo Kawamata, Yokohama; Hikotada Tsuboi, Yokohama, and Nobuhito Koga, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 131,804, Mar. 19, 1980, Pat. No. 4,376,206.
This application Aug. 13, 1982, Ser. No. 408,042
Int. Cl.[3] **C07D** *207/40*
U.S. Cl. 548—522 **20 Claims**

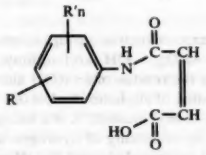
1. Process for the preparation of an alkenylphenylmaleimide having the formula:


(I)

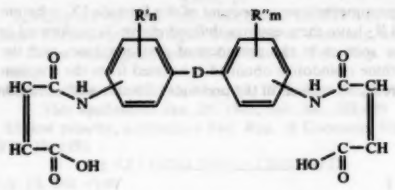
wherein R is alkenyl having 3 to 12 carbon atoms, R′ is hydrogen, halogen or alkyl having 1 to 4 carbon atoms, and n is a whole number of 1 to 4, or a bismaleimide having the formula:


(II)

wherein R′ and R″ can be the same or different and are hydrogen, halogen or straight-chain or branched alkyl having 1 to 4 carbon atoms, n and m are whole numbers of 1 to 4, and D is an ethylenically unsaturated hydrocarbon group having 6 to 24 carbon atoms, which comprises the step of effecting reaction of an alkenylphenylmaleic acid derivative having the formula:


(III)

wherein R, R′ and n are as defined above for formula (I), or a linear dimer of like or different alkenylphenylmaleamic acid derivatives having the formula:



(IV)

wherein R', R", n, m and D are as defined above for formula (II), with at least one dehydrating agent which is a carboxylic acid anhydride in the presence of a tertiary amine, an organic solvent and a catalyst, the catalyst being selected from the group consisting of: sodium sulfate, sodium carbonate, sodium phosphate, potassium sulfate, potassium carbonate, potassium phosphate, lithium sulfate, lithium carbonate, lithium phosphate, iron sulfate, iron carbonate, iron phosphate, nickel sulfate, nickel carbonate, nickel phosphate, cobalt sulfate, cobalt carbonate, cobalt phosphate, copper sulfate, copper carbonate, copper phosphate, manganese sulfate, manganese carbonate, manganese phosphate, sodium nitrate, sodium acetate, sodium butyrate, potassium nitrate, potassium acetate, potassium butyrate, lithium nitrate, lithium acetate, lithium butyrate, iron nitrate, iron acetate, iron butyrate, nickel nitrate, nickel acetate, nickel butyrate, cobalt nitrate, cobalt acetate, cobalt butyrate, manganese nitrate, manganese acetate, manganese butyrate, copper nitrate, copper acetate, copper butyrate, sodium pyrophosphate, nickel pyrophosphate, potassium pyrophosphate, lithium pyrophosphate, manganese pyrophosphate, iron pyrophosphate, copper pyrophosphate, acetylacetone complex of iron, acetylacetone complex of nickel, acetylacetone complex of cobalt, acetylacetone complex of copper and acetylacetone complex of manganese, to form the corresponding alkenylphenylmaleimide or bismaleimide.

4,500,720

TETRAHYDROFURAN-2-ONES

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

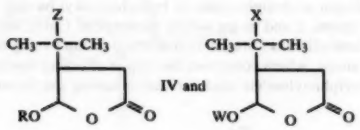
Division of Ser. No. 394,457, Jul. 1, 1982, Pat. No. 4,386,210, which is a division of Ser. No. 153,338, May 27, 1980, Pat. No. 4,288,434. This application Jan. 19, 1984, Ser. No. 571,995

Claims priority, application France, Jun. 6, 1979, 79 14425

Int. Cl.³ C07D *307/32*

U.S. Cl. 549—313 **1 Claim**

1. A compound selected from the group consisting of compounds of the formulae



wherein Z is an electro-attractive group selected from the group consisting of —NO_2, —OH, aryl sulfonyl and triarylphosphonio halo, R is the residue of an ROH alcohol selected from the group consisting of aliphatic alcohol of 1 to 12 carbon atoms and 3-phenoxy-benzyl alcohol, X is a halogen and W is selected from the group consisting of hydrogen and R_1, R_1 is derived from a chiral or achiral alcohol R_1OH selected from the group consisting of aliphatic alcohol of 1 to 12 carbon atoms, 3-phenoxy-benzyl alcohol and α-methyl 3-phenoxy-benzyl alcohol.

4,500,721

PROCESS FOR PRODUCING BENZALDEHYDES

Hiroshi Yamachika, and Hirotoshi Nakanishi, both of Osaka, Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Filed Feb. 23, 1983, Ser. No. 468,909

Claims priority, application Japan, Feb. 23, 1982, 57-28264; Feb. 24, 1982, 57-29181

Int. Cl.³ C07C *45/44*

U.S. Cl. 549—362 **11 Claims**

1. A process for producing a benzaldehyde by catalytic reduction using hydrogen gas of a benzonitrile in a water-soluble organic solvent in the presence of an inorganic acid using a Raney nickel catalyst pretreated with a copper salt.

4,500,722

VOLATILE METAL COMPLEXES

David A. Thompson, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 15, 1982, Ser. No. 418,061

Int. Cl.³ C07D *307/04*

U.S. Cl. 549—429 **1 Claim**

1. A THF adduct of a β-diketone complex of 1,1,1,5,5,5-hexafluoro-2,4-pentanedione with the metal magnesium, the adduct having the molecular formula:

$$Mg(hfa)_2.nTHF$$

wherein n has a value of 2 or 4.

4,500,723

7-OXABICYCLOHEPTAINE PROSTAGLANDIN INTERMEDIATES AND METHOD FOR PREPARING SAME

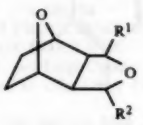
Peter W. Sprague, Pennington, and James E. Heikes, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 13, 1983, Ser. No. 494,235

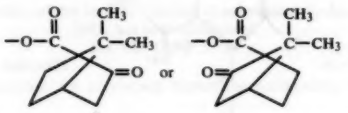
Int. Cl.³ C07D *307/88*

U.S. Cl. 549—459 **8 Claims**

1. An optically active cis exo isomer having the structure

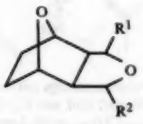


wherein one of R^1 and R^2 is

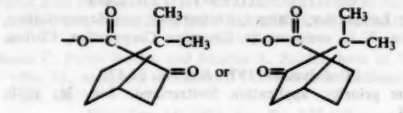


and the other is H.

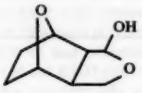
8. A method for preparing an optically active ketopinate ester of the structure



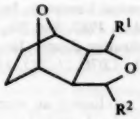
wherein one of R^1 and R^2 is



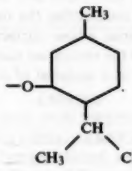
and the other is H which comprises esterifying a hemiacetal of the formula



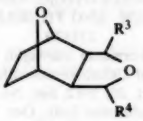
by reacting same with d or l-menthol to form a mixture of diastereomers, resolving the above mixture to recover 90% optically pure diastereomer of the structure



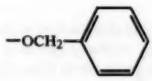
wherein R^2 is



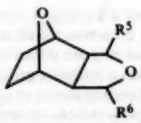
and R^1 is H, reacting the above hemiacetal with benzyl alcohol to form the optically active compound



wherein R^4 is



and R^3 is H, hydrogenating the benzyloxy compound to form a hemiacetal of the structure



wherein R^6 is OH and R^5 is H, reacting the hemiacetal with l or d-ketopinic acid halide to form the optically active ketopinate ester.

4,500,724

METHOD FOR MAKING ALKYLHALOSILANES

William J. Ward, III, Schenectady; Alan Ritzer, Sand Lake; Kenneth M. Carroll, Albany, and John W. Flock, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 28, 1983, Ser. No. 518,236
Int. Cl.³ C07C *7/16*
U.S. Cl. 556—472 **28 Claims**

27. A method for making methylchlorosilanes which substantially enhances the rate of dimethyldichlorosilane formation while substantially reducing the weight ratio of methyltrichlorosilane to dimethyldichlorosilane and maintaining or reducing the percent by weight of products in the resulting methylchlorosilane crude having a boiling point of greater than 70° C. at atmospheric pressure, which comprises effecting reaction between methyl chloride and powdered silicon in the presence of an effective amount of a copper-zinc-tin catalyst where the copper-zinc-tin catalyst comprises from 0.5 to 10% by weight of copper relative to silicon and 200–3000 ppm of tin and 0.01 part to 0.5 part of zinc per part of copper.

4,500,725

SILANE DERIVATIVE AND FRAGRANT ARTICLE

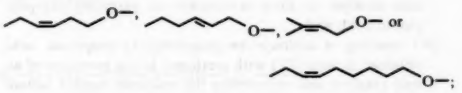
Jiichiro Yemoto, Kumamoto; Ryokichi Tarao, Kanagawa, and Yoshio Yamamoto, Kumamoto, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jul. 28, 1982, Ser. No. 402,811
Claims priority, application Japan, Jul. 30, 1981, 56-119641; Nov. 24, 1981, 56-187950
Int. Cl.³ C07F *7/04, 7/08, 7/18*
U.S. Cl. 556—482 **7 Claims**

1. A silane compound of the formula:

$$R_sSi(-OR')_t(-OR'')_{4-s-t}$$

wherein R represents CH_3—, CH_3CH_2— or CH_2=CH—; R'O represents



R''O represents CH_3O— or CH_3CH_2O—; s represents 0 or 1; and t represents an integer of from 1 to 4.

4,500,726

METHOD FOR PREPARING N-BENZYLOXYCARBONYL AMINO ACIDS CONTAINING ADDITIONAL FUNCTIONALITY

James A. Krogh, Mount Prospect, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 23, 1984, Ser. No. 613,136
Int. Cl.³ C07C *125/065*
U.S. Cl. 56—160 **24 Claims**

1. In the method wherein alkali metal salt of an amino acid which is devoid of tertiary amino groups and quaternary ammonium groups, and which contains in addition to a primary amino group and at least one carboxylate anion, at least one functional group selected from the class consisting of hydroxyl, additional primary amino, secondary amino, primary imido, and primary amido, is reacted with benzylhaloformate selected from the class consisting of ring-substituted benzylchloroformate, ring-unsubstituted benzylchloroformate, ring-substituted benzylbromoformate, and ring-unsubstituted benzylbromoformate in a polyphase reaction mixture comprising

an organic liquid phase and an aqueous liquid phase to produce alkali metal salt of an N-benzyloxycarbonyl amino acid in which the benzyl is substituted or unsubstituted and which contains said functional group, the improvement comprising conducting the reaction in the presence of a phase-transfer reagent comprising poly(oxyalkylene)glycol, polymer-supported poly(oxyalkylene)alcohol, or a mixture thereof.

4,500,727

PROCESS FOR PRODUCING METHYL LACTATE

Takanori Kitamura; Mitsuo Matsumoto, and Masuhiko Tamura, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 18, 1982, Ser. No. 359,414

Claims priority, application Japan, Mar. 23, 1981, 56-42755; Jun. 19, 1981, 56-95478; Jun. 19, 1981, 56-95479

Int. Cl.³ C07C *69/68, 67/03*

U.S. Cl. 560—179 **10 Claims**

1. A process for producing methyl lactate, which comprises the steps of:

(I) hydroformylating vinyl acetate or vinyl propionate with a gaseous mixture of hydrogen and carbon monoxide in an organic solvent in the presence of a substantially water-insoluble rhodium complex and a trisubstituted phosphine to form α-acetoxy- or propionyloxypropionaldehyde; '(II) extracting the reaction mixture obtained in step (I) with an aqueous medium, thereby obtaining an aqueous layer contaning α-acetoxy- or propionyloxy-propionaldehyde and an extraction residue containing the catalyst components, and recycling the extraction residue to the hydroformylation step (I);

(III) separating α-acetoxy- or propionyloxy-propionaldehyde from the aqueous layer containing the same as obtained in step (II);

(IV) oxidizing α-acetoxy- or propionyloxy-propionaldehyde obtained in step (III) in the liquid phase with oxygen gas or an oxygen-containing gas in the presence of an oxidation catalyst to form α-acetoxy- or propionyloxy-propionic acid; and

(V) reacting α-acetoxy- or propionyloxy-propionic acid obtained in step (IV) with methanol in the presence of an acid catalyst, and recovering the resultant methyl lactate by distillation.

4,500,728

PROCESS FOR PREPARING 2-AMINOETHYL METHACRYLATE SALTS OF HIGH PURITY

Michael J. Fazio, Midland, Mich., and Kirk E. Paisley, Newark, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 8, 1980, Ser. No. 138,622

Int. Cl.³ C07C *69/54*

U.S. Cl. 560—222 **8 Claims**

1. A process for preparing 2-aminoethyl methacrylate of high purity comprising introducing 2-isopropenyl-2-oxazoline to a liquid aqueous medium containing an acid selected from the group consisting of hydrobromic acid, phosphoric acid, sulfuric acid, nitric acid, organic carboxylic acids, sulfonic acids and mixtures thereof; at a rate to maintain a continuous concentration of no greater than about 0.12 weight percent 2-isopropenyl-2-oxazoline in its free form in the medium.

4,500,729

2-METHYL-2-BUTEN-1-YL TIGLATE

Dietmar Lamparsky, Wangen, Switzerland, and Roman Kaiser, Clifton, N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Jun. 26, 1979, Ser. No. 52,175

Claims priority, application Switzerland, Jun. 28, 1978, 7037/7G

Int. Cl.³ C07C *69/533*

U.S. Cl. 560—225 **1 Claim**

1. Substantially pure 2-methyl-2-buten-1-yl tiglate.

4,500,730

PROCESS FOR PRODUCING AROMATIC POLYCARBOXYLIC ACID

Toru Tanaka; Masanori Hataya; Kazuo Tanaka; Yukio Sakai, and Yasufumi Hamada, all of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Filed Jan. 3, 1983, Ser. No. 454,982

Claims priority, application Japan, Jan. 18, 1982, 57-5749

Int. Cl.³ C07C *51/235, 51/265*

U.S. Cl. 562—416 **10 Claims**

1. In a process for producing an aromatic polycarboxylic acid by oxidizing an alkyl-substituted aromatic aldehyde or an alkyl-substituted aromatic carboxylic acid with molecular oxygen in water as a solvent in the presence of bromine ions or bromine ions and heavy metal ions as a catalyst, the improvement, which comprises conducting the oxidation in a reactor using a zirconium material whose surface is coated with an oxide layer formed from the zirconium material having a thickness of at least 0.05 μm as a material of construction.

4,500,731

DERIVATIVES OF 4-PHENYL-4-OXOBUTEN-2-OIC ACID, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, AND THERAPEUTIC USES FOR THEM

Mario Bianchi, and Fernando Barzaghi, both of Milan, Italy, assignors to Roussel Uclaf, Romainville, France

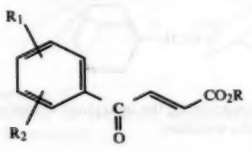
Filed Oct. 20, 1982, Ser. No. 435,464

Claims priority, application Italy, Oct. 22, 1981, 49547 A/81

Int. Cl.³ C07C *59/90*

U.S. Cl. 514—452 **17 Claims**

1. A compound of formula I:



(I)

in which R represents a hydrogen atom or an alkyl group containing from 1 to 8 carbon atoms, and R_1 and R_2 in any position on the benzene ring are different from each other and independently represent a hydroxy group or an alkoxy group containing from 1 to 8 carbon atoms, or else R_1 and R_2 together form an $—OCH_2CH_2O—$radical, as well as the alkali metal, alkaline earth metal, ammonium or amine salts of the said product of formula I when R represents a hydrogen atom.

4,500,732

PROCESS FOR REMOVAL AND RECYCLE OF P-TOLUIC ACID FROM TEREPHTHALIC ACID CRYSTALLIZER SOLVENT

Bruce C. Petty-Weeks, and Martin A. Zeitlin, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 15, 1983, Ser. No. 532,461
Int. Cl.³ C07C 51/43
U.S. Cl. 562—486 7 Claims

1. A continuous process for removal of p-toluic acid from a liquid water solution substantially saturated with terephthalic acid wherein the terephthalic acid content in water is in the range of about 5 to about 35 weight percent at a temperature of about 400° to about 550° F. and wherein the water solution comprises about 500 to about 6,000 ppm of p-toluic acid said process comprising, after continuously charging such liquid water solution to the first of two or more series-connected flash solvent evaporators wherein each crystallization zone is operated at a successively lower temperature with at least the last zones operated at a temperature within and below the range of about 375° F. to about 300° F., crystallizing decreasing proportions of originally dissolved terephthalic acid, extracting the terephthalic acid of its p-toluic acid between any two continuous crystallization zones with paraxylene, removing the flash evaporated solvent from each zone while retaining temperature of recovery of terephthalic acid product the same as the temperature of the last zone and removing the paraxylene containing p-toluic acid from a multistage extraction zone.

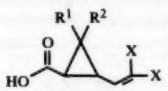
4,500,733

PROCESS FOR PREPARING DIHALOVINYLCYCLOPROPANECARBOXYLIC ACIDS

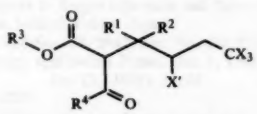
Kiyoshi Kondo, and Kiyohide Matsui, both of Kanagawa, Japan, assignors to Sagami Chemical ResearchCenter, Tokyo, Japan

Continuation of Ser. No. 935,190, Aug. 21, 1978, abandoned, and Ser. No. 731,195, Oct. 12, 1976, abandoned. This application Feb. 14, 1983, Ser. No. 466,182
Claims priority, application Japan, Oct. 30, 1975, 50-131254
Int. Cl.³ C07C 69/743
U.S. Cl. 562—506 11 Claims

1. A process for preparing a 2-(2,2-dihalovinyl)cyclopropanecarboxylic acid of the formula



wherein R^1 and R^2 each independently is hydrogen or a hydrocarbon group, and X is halogen, which comprises reacting an α-acyl-γ-halocarboxylic acid derivative of the formula



wherein R^1, R^2 and X are as defined above, R^3 is hydrogen or lower alkyl, X' is halogen of atomic number equal to or higher than X, and R^4 is a hydrogen, or lower alkyl; with an alkali metal hydroxide or alkaline earth metal hydroxide in an ether type solvent.

4,500,734

PROCESS FOR THE PRODUCTION OF UREA

Vincenzo Lagana', Milan, and Virginio Cavallanti, Vailate, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 215,168, Dec. 11, 1980, abandoned. This application Apr. 12, 1982, Ser. No. 367,792
Int. Cl.³ C07C 126/02
U.S. Cl. 564—72 1 Claim

1. A process for the production of urea starting from ammonia and carbon dioxide in a NH_3/CO_2 ratio of from 5/1 to 8/1 comprising the synthesis and decomposition of the ammonium carbamate contained in the solution of urea in two steps, the first providing for ammonia and the second for carbon dioxide as strippers, characterized by the fact that the synthesis and decomposition in the first decomposition step are carried out at a pressure equal or substantially equal and comprised between 180 and 250 atm, and where from the first decomposition zone a solution of urea containing from 5 to 25% of carbamate is discharged with a gaseous phase containing a quantity of ammonia in excess with regard to the stoichiometric quantity for forming ammonium carbamate, said excess ammonia being from 50% and 90% of the total gas throughput, while the decomposition in the second step is carried out at a pressure 30–50 atm. lower than the pressure in the first step and the gases leaving the reactor being fed to the bottom of the decomposer in the second decomposition step.

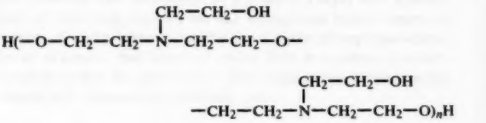
4,500,735

QUATERNARY CROSSLINKED PRODUCTS OF XYLYLENE DICHLORIDES AND TRIETHANOLAMINE CONDENSATES AND THEIR USE

Helmut Diery, Kelkheim, Fed. Rep. of Germany, and Bernhard Mees, Charlotte, N.C., assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 18, 1983, Ser. No. 467,738
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1982, 3206459
Int. Cl.³ C07C 91/12
U.S. Cl. 564—286 3 Claims

1. Quaternary crosslinked products obtained by reacting, at about 70 to about 160 degrees C., a triethanolamine condensate of the formula



wherein n is an integer from 1 to 3, with a xylylene dichloride, the ratio of triethanolamine condensate to xylylene dichloride being from about 1:0.5 to about 1:0.05.

4,500,736

HYDROGENATION OF 3-TRICHLOROVINYLNITROBENZENE

Jean M. Wyvratt, Mountainside, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 414,116, Sep. 2, 1982, abandoned. This application Jun. 28, 1983, Ser. No. 508,063
Int. Cl.³ C07C 85/11
U.S. Cl. 564—417 9 Claims

1. A process for preparing 3-trichlorovinyl aniline and acid addition salts thereof which comprises hydrogenating in an alcoholic acidic medium 3-trichlorovinylnitrobenzene under an atmosphere of hydrogen at from 15 to 105 psig in the presence of from 0.2 to 2.0% supported palladium catalyst containing from 5 to 10% palladium on a substrate.

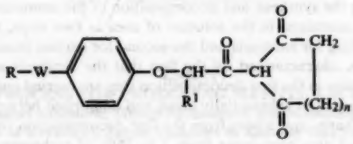
4,500,737

COMPOSITIONS

Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 408,291, Aug. 16, 1982, Pat. No. 4,448,965.
This application Mar. 2, 1984, Ser. No. 585,485
Int. Cl.[3] C07C 49/657
U.S. Cl. 568—329 5 Claims

1. A compound of the following formula (A):



(A)

wherein,
n is zero, one, two or three;
R is

R^1 is hydrogen or lower alkyl;
W is oxygen, sulfur or amino; and
each of Y and Z is independently selected from hydrogen, lower haloalkyl, halogen and nitro.

4,500,738

PREPARATION OF ALKOXY METHYL ETHERS

Henry G. Schouten, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 8, 1983, Ser. No. 560,011
Int. Cl.[3] C07C 41/14, 45/64
U.S. Cl. 568—433 5 Claims

1. A process for the production of an alkoxymethyl oxyether of a phenolic hydroxyl group which comprises reacting methylal or ethylal with said phenolic hydroxyl group in the presence of dimethylformamide and phosphorus oxychloride.

4,500,739

PROCESS FOR THE INSERTION OF PERFLUOROOLEFINES ON PERFLUOROPOLYETHERS AND CORRESPONDING PRODUCTS

Gerardo Caporiccio, Milan; Gian T. Viola, Paullo, and Costante Corti, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Mar. 18, 1983, Ser. No. 476,518
Claims priority, application Italy, Mar. 19, 1982, 20270 A/82
Int. Cl.[3] C07C 43/12, 41/01, 55/40
U.S. Cl. 568—677 3 Claims

1. Perfluoropolyether consisting of recurring $—CF_2—$, $—CF_2CF_2—$ units and a third recurring at least partially fluorinated alkylenic unit containing at least three carbon atoms and comprising acid or neutral terminal groups selected from the group consisting of $—CF_3$, C_2F_5, $—CF_2H$, —COF and $—CF_2—COF$, said recurring $—CF_2—$, $—CF_2CF_2$ and alkylenic units being joined to each other through oxygen atoms with etheric bonds, and being arranged in a random distribution along the polymeric chain.

4,500,740

HYDROLYSIS OF WATER-INSOLUBLE ORGANIC HALIDES

David W. House, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 30, 1983, Ser. No. 567,204
Int. Cl.[3] C07C 37/02
U.S. Cl. 568—796 4 Claims

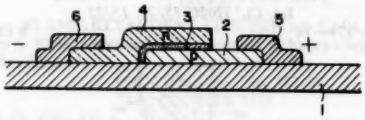
1. A method of hydrolyzing a water-insoluble organic halide, other than a fluoride, where the organic halide is a secondary or tertiary alkyl halide whose alkyl moiety contains up to about 20 carbon atoms, an arylmethyl halide, or an activated aryl halide where said aryl moiety bears at the 2- or 4-position relative to the halogen at least one strongly electron withdrawing moiety selected from the group consisting of trialkylammonium, nitro, nitrilo, carboxyl, carbonyl, fluorine, and nitroso, comprising heating the organic halide in dimethylsulfoxide at a temperature between about 50° and 100° C., contacting the resulting mixture with at least a stoichiometric quantity of water, and recovering the hydrolysis product formed thereby.

4,500,741

ENERGY CONVERSION ELEMENT

Kiyoshi Morimoto, Mobara, and Toshinori Takagi, Nagaokakyo, both of Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed May 25, 1983, Ser. No. 498,168
Claims priority, application Japan, Jun. 4, 1982, 57-94877
Int. Cl.³ H01L *35/00, 37/00*
U.S. Cl. 136—206 **29 Claims**



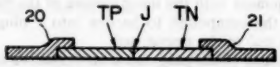
1. An energy conversion element comprising a thermoelectric material having a thermoelectric effect and a photoelectric material having a photoelectric effect which materials are different in kind from each other and which are directly contacting each other, wherein a positively ionized donor or a negatively ionized acceptor generated due to the flow of a carrier corresponding to a temperature gradient across the thermoelectric material forms an acceleration electrical field with respect to electrons or positive holes generated in the photoelectric material at the junction between said thermoelectric and photoelectric materials.

4,500,742

IRON SILICIDE THERMOELECTRIC CONVERSION ELEMENT

Kiyoshi Morimoto, Mobara, and Toshinori Takagi, Nagaokakyo, both of Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Jan. 26, 1984, Ser. No. 574,145
Claims priority, application Japan, Feb. 9, 1983, 58-18848
Int. Cl.³ H01L *35/00, 37/00*
U.S. Cl. 136—206 **4 Claims**



1. An iron silicide thermoelectric conversion element comprising a compound consisting of iron and silicon wherein a part of one of components of said compound forming said element is substituted by oxygen atom to provide said element with one of n-type conductivity and p-type conductivity.

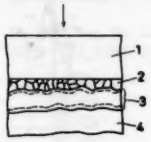
4,500,743

AMORPHOUS SEMICONDUCTOR SOLAR CELL HAVING A GRAINED TRANSPARENT ELECTRODE

Yutaka Hayashi; Mithuyuki Yamanaka, both of Sakura; Hideyo Iida, Ueno; Nobuyasu Shiba, Ueno; Hideyuki Karasawa, Ueno; Toshio Mishuku, Ueno, and Atsuo Itou, Ueno, all of Japan, assignors to Kogyo Gijutsuin and Taiyo Yuden Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,712
Claims priority, application Japan, Oct. 1, 1981, 56-154749
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—258 **5 Claims**

1. An amorphous semiconductor solar cell comprising a glass substrate, a transparent electrode means coated on said substrate, an amorphous semiconductor layer coated on said transparent electrode means, and a rear electrode on said amorphous semiconductor layer, wherein the average grain diameter of the surface of the transparent electrode means which faces the amorphous semiconductor layer ranges from 0.1 μm to 2.5 μm, and wherein said transparent electrode means has a



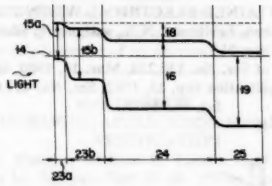
rough and uneven surface facing said amorphous semiconductor layer for causing diffusion of the incident light.

4,500,744

PHOTOVOLTAIC DEVICE

Hidetoshi Nozaki, Yokohama; Takaaki Kamimura, Kawasaki; Tamothu Hatayama, Matsudo, and Tadashi Utagawa, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 13, 1983, Ser. No. 513,390
Claims priority, application Japan, Jul. 16, 1982, 57-122940
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—258 **15 Claims**



1. A photovoltaic device comprising a transparent substrate, an amorphous silicon layer structure of a p-i-n type formed on the substrate and comprised of a p-layer, i-layer and n-layer, and an electrode formed on the amorphous silicon layer, in which, of said p-layer and said n-layer of the amorphous silicon layer structure, that layer on which light is incident is constituted such that the optical forbidden band gap is greater on the i-layer side than on the substrate side.

4,500,745

HYBRID ELECTRICAL INSULATOR BUSHING

Michael R. Miggins, LeRoy, N.Y., assignor to Interpace Corporation, Purchase, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,780
Int. Cl.³ H01B *17/28, 17/34*
U.S. Cl. 174—31 R **10 Claims**

1. An electrical bushing comprising:

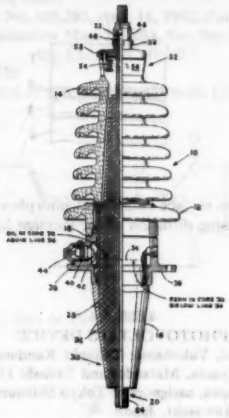
a core formed of sheets of electrically conducting material separated by electrically insulating material, said sheets of electrically conducting material being interleaved with and, coaxially disposed with the electrically insulating material;

an insulating casing enclosing an end of said core;

an electrically conducting rod traversing said core, and extending from an end of said core to form a terminal; and wherein

said insulating material includes a cured resin at one end of

said core, and an insulating oil at a second end of said core within said casing; said resin being absent from said sec-



ond end of said core, and said oil being absent from said one end of said core.

4,500,746

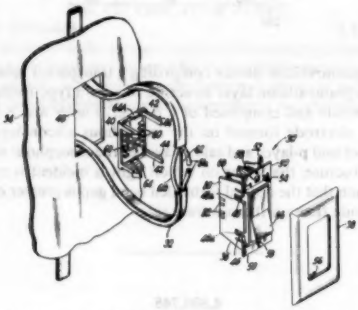
SELF-CONTAINED ELECTRICAL WIRING DEVICE

James E. Meehan, Levittown, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Continuation of Ser. No. 130,224, Mar. 14, 1980, abandoned. This application Sep. 13, 1982, Ser. No. 417,082

Int. Cl.³ H02G *3/08*

U.S. Cl. 174—48 **17 Claims**



1. An electrical component for coupling to an electrical cable and adapted to be mounted through an opening in a supporting base, said component comprising:

an enclosure having a front face and side walls projecting rearwardly therefrom to form an opening along their rear edges opposite said front face, said side walls including apertures therein generally adjacent said front face;

a cover adapted to be secured to said enclosure generally adjacent said rear edges so as to be spaced apart from said front face by said side walls, said cover having a set of flexible legs extending from edges thereof and terminating in tabs adapted to be received in said apertures for securing said cover directly to said enclosure yet permit removal of the cover when desired by removing said tabs from said apertures, such that said cover closes the rear edges of said side walls by locking engagement between said tabs and said apertures generally adjacent said front face.

4,500,747

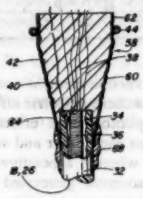
GAS PRESSURIZABLE CABLE WITH COMPRESSED PLUG SEAL AND METHOD OF MAKING IT

Luc Dubreuil, St. Placide, and Phillip J. Reed, Dorval, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 30, 1983, Ser. No. 480,258

Int. Cl.³ H02G *15/23, 15/25*

U.S. Cl. 174—76 **9 Claims**



1. A method of providing a plug seal for gas pressurizable cable having a core of insulated conductors and core surrounding material including a jacket, the method comprising:

(a) removing all core surrounding material from an end section of the cable so as to provide a certain length of the cable at its end which is devoid of core surrounding material and which has a jacket end region adjacent to the devoid length;

(b) locating an inwardly deformable sleeve around and contacting the jacket end region, the sleeve extending along and surrounding the devoid length and being radially spaced from the insulated conductors of the devoid length;

(c) causing a flowable plugging compound to flow into the sleeve, between the insulated conductors so as to surround them and engage the insulation of individual conductors intimately, around the jacket end regions, and into intimate engagement with the inner surface of the sleeve;

(d) allowing the compound to harden into a plug which causes it to seal to the sleeve; and

(e) after hardening of the plug and with the sleeve sealed to the jacket end region, placing the plug in radial compression in at least one axial position along said devoid length by moving a radially resilient spring into a position surrounding the sleeve, the spring being in a permanently resiliently expanded condition when around the sleeve so as to compress the sleeve radially inwards to improve its seal against the plug and to compress the plug radially inwards in order to compress the insulation of the conductors onto the conductors.

6. A cable having a core of insulated conductors and core surrounding material including a jacket, and a plug seal in which the cable has a certain length at one of its ends which is devoid of core surrounding material, the plug seal comprising:

(a) a plug formed by hardened plugging compound which surrounds the core along said devoid length at the cable end and surrounds and is sealed against end regions of the jacket lying adjacent to the devoid length, the plug in said devoid length extending around and in intimate engagement with the insulation of each individual conductor of the core;

(b) an inwardly deformable sleeve surrounding and sealed to the plug along both said devoid length and the end regions of the jacket, the sleeve extending beyond the plug to form a junction with the jacket and having a seal at its junction with the jacket;

(c) a radially resilient spring surrounding the sleeve in at least one axial position of said devoid length, the spring being in a permanently resiliently expanded condition

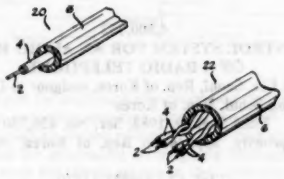
permanently to place a radially inward compressive force upon the sleeve to improve its seal against the plug and permanently to place a radially inward compressive force upon the plug, the plug being compressed radially inwards to cause the plug to compress the insulation of the individual conductors onto the conductors.

4,500,748

FLAME RETARDENT ELECTRICAL CABLE

Gary S. Klein, Cleveland, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 8, 1983, Ser. No. 483,360
Int. Cl.³ H01B 7/28
U.S. Cl. 174—121 A **2 Claims**



1. A flame retardant electrical cable comprising at least one elongate electrical conductor having a layer of electrical insulation disposed thereabout within a protective jacket that is able to meet or exeed the flame spread requirements of Underwriters Laboratories Tunnel Flame Test UL 910 as a result of at least one of said conductor insulation and jacket being made from a first melt processible, non-fluorocarbon, polymer and the other of said conductor insulation and jacket being made from a second melt processible polymer selected from the class consisting of fluorocarbon and non-fluorocarbon polymers, said cable satisfying the condition that the composite Steiner Index of the first and second polymers is less than about 3500 according to the formula:

$$\frac{(\text{mass of first polymer})\,(S.I.\text{ of first polymer})}{(\text{total mass of first and second polymers})} + \frac{(\text{mass of second polymer})\,(S.I.\text{ of second polymer})}{(\text{total mass of first and second polymers})} = S.I.\text{ (composite)};$$

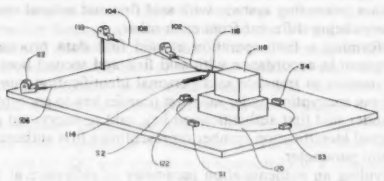
where S.I. (Steiner Index) is (A) (B) (C) (1−O.I.);
wherein:
mass is the respective number of pounds of the first and second polymers included in the cable subjected to the UL 910 Flame Test;
(A) is the respective specific heat of the first and second polymers in Btu/lb;
(B) is the respective specific gravity of the first and second polymers;
(C) is the respective percent by molecular weight of non-halogenated elements of the first and second polymers to the respective total molecular weight thereof expressed in decimal form; and
O.I. is the respective Limiting Oxygen Index of the first and second polymers under ASTM D2863 expressed in decimal form;
and said cable devoid of any component disposed as a barrier intermediate the conductor insulation and the jacket having at least a portion thereof made from a polymer having more than about 35% by molecular weight of fluorine to the total molecular weight of the polymer.

4,500,749

INCREMENTAL DIGITIZER FOR ENCODING GEOMETRICAL FORMS

Behrokh Khoshnevis, 2-102G Montasello Village, Athens, Ohio 45701

Filed Dec. 14, 1982, Ser. No. 449,589
Int. Cl.³ G01B 7/28; G08C 21/00
U.S. Cl. 178—18 **13 Claims**



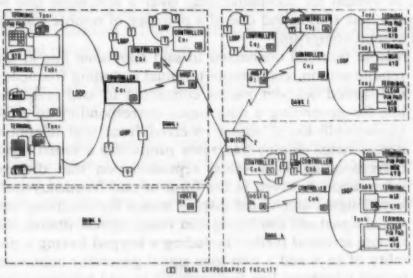
8. A digitizer for digitally encoding a three-dimensional body mounted to a support into coordinate system data representing the body, the digitizer comprising:
(a) a stylus having a data tip;
(b) three retractable, flexible cords each extending from a different, spaced cord supply into attachment with said stylus and all substantially intersecting said data tip each of said cords being biased in tension toward retraction at least one spaced cord supply being positioned above a reference plane defined by a point on said body and the other two of said cord supplies; and
(c) a different linear encoder means linked to each of said cords for generating digital data signals representing the linear displacement of its associated cord.

4,500,750

CRYPTOGRAPHIC APPLICATION FOR INTERBANK VERIFICATION

Robert C. Elander; Richard E. Lennon, both of Saugerties; Stephen M. Matyas; Carl H. W. Meyer, both of Kingston; Robert E. Shuck, West Hurley, all of N.Y., and Walter L. Tuchman, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,974
Int. Cl.³ H04L 9/02
U.S. Cl. 178—22.08 **25 Claims**



24. In a system providing data communication between a terminal and one of a plurality of data processing systems, each having cryptographic apparatus and said terminal being provided with a first transfer key, a process for verifying the identity of a terminal user provided with a secret personal identification number comprising the steps of:
encrypting said personal identification number at said terminal under said first transfer key to obtain a first encrypted personal identification number,

transmitting a message including at least said first encrypted personal identification number from said terminal to a first one of said plurality of data processing systems,

providing a first host parameter at said first data processing system representing said first transfer key encrypted under a first system master key of said first data processing system,

providing a second host parameter at said first data processing system representing a first authentication key encrypted under a second system master key of said first data processing system, with said first and second master keys being different from each other,

performing a first operation at said first data processing system in accordance with said first and second host parameters to translate said personal identification number from encryption under said first transfer key to encryption under said first authentication key, said re-encrypted personal identification number representing a first authentication parameter,

providing an authentication parameter of reference at said first data processing system, and

comparing said first authentication parameter with said authentication parameter of reference at said first data processing system to provide an indication representing a verification of the identity of the terminal user.

4,500,751

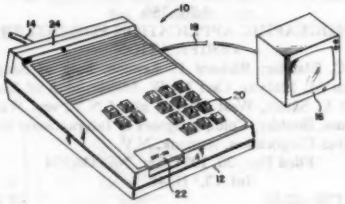
DATA COMMUNICATION SYSTEM

Michael L. Darland; Donald L. Stoner; James W. Baker, Jr., and Michael A. Sponhnholtz, all of King County, Wash., assignors to Microperipheral Corporation, Redmond, Wash.

Filed Jul. 20, 1982, Ser. No. 400,060

Int. Cl.³ H04M *11/00*

U.S. Cl. 179—2 DP **18 Claims**



1. A system for communicating over a telephone line between a host station and one of a plurality of remote stations, said system comprising:

a remote terminal connected to said telephone line at said remote station, said remote terminal including frequency-shift-keyed decoder means connected to said telephone line for generating a data signal corresponding to a frequency-shift-keyed signal received from said telephone line, a visual display generator producing a visual signal corresponding to a visual representation that displays information received in the form of said frequency-shift-keyed signal and visual display means for receiving said visual signal and displaying said visual representation, said remote terminal further including a keypad having a plurality of keys and a two-tone signal generator connected to said telephone line for applying to said telephone line pairs of tones, each uniquely corresponding to one of said keys, card reader means for generating a digital signal indicative of information recorded on a card adapted for insertion in said card reader means, and a frequency-shift-keyed modulator connected to said card reader means and said telephone line applying a frequency-shift-keyed signal to said telephone line corresponding to the digital signal received from said card reader means; and

a host terminal connected to said telephone line at said host station, said host terminal including a frequency-shift-keyed modulator connected to said telephone line applying a frequency-shift-keyed signal to said telephone line corresponding to a data signal received from an external source and a two-tone decoder connected to said telephone line, said decoder generator a data byte identifying the tone pair being received, said host terminal further including a frequency-shift-keyed decoder connected to said telephone line generating a digital signal corresponding to the frequency-shift-keyed signal received from said remote terminal, thereby identifying the information recorded on said card.

4,500,752

TELECONTROL SYSTEM FOR AN AUDIO RECORDER OF A RADIO TELEPHONE

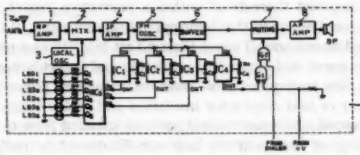
Kyung-Suk Lee, Seoul, Rep. of Korea, assignor to Daewoo Electronic Co., Seoul, Rep. of Korea

Filed Sep. 29, 1982, Ser. No. 426,730

Claims priority, application Rep. of Korea, Jun. 8, 1982, 2550[U]

Int. Cl.³ H04M *11/10*

U.S. Cl. 179—2 EA **4 Claims**



1. A base remote control system for remotely controlling a tape recorder coupled to the main base unit of a cordless telephone, said recorder being actuated by a recorder control signal, said main base unit including means for receiving and demodulating a transmitted signal from a handset of said cordless telephone, and means for transmitting to said handset a received telecommunications signal from a telephone line upon actuation of a switching means, said main base unit including a transformer coupling means to couple the received demodulated signal with said means for transmitting, the remote control system comprising:

a base tone decoding means coupled to the output of said means for receiving and demodulating, said base tone decoding means having a group of outputs at which are applied a received and tone decoded control signal for said recorder from said handset;

a plurality of base tone oscillators, one base tone oscillator coupled to a respective output of said group of outputs of said base tone decoding means to generate a respective frequency control signal corresponding to the input tone decoded control signal, the outputs of said base tone oscillators coupled together to generate a multi-frequency control signal;

means for combining the multi-frequency control signal with any additional signal to be transmitted by said main base unit to said handset; and

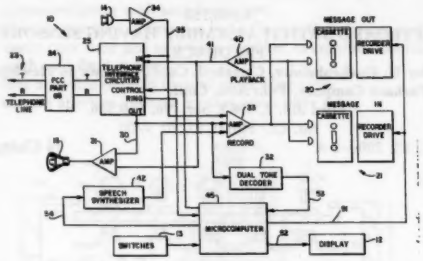
a decoder interface device coupling a respective output of said group of outputs of said base tone decoding means with the corresponding input of said recorder to actuate said recorder by said recorder control signal corresponding to the tone decoded control signal.

4,500,753

TELEPHONE ANSWERING APPARATUS WITH RECORDED TIME OF DAY AND DATE

Luther C. Plunkett, Jr., Atlanta, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.

Filed Aug. 25, 1982, Ser. No. 411,529
Int. Cl.[3] H04M *11/00*
U.S. Cl. 179—6.03 10 Claims



1. In an apparatus for automatically recording on a recording media audio incoming message signals received over a telephone line including means responsive to a ring signal on the telephone line for generating an outgoing message signal for transmission over the telephone line to the caller and means responsive to detection of the end of said outgoing message signal for conditioning a recorder to record said incoming message signals, the improvement comprising:

clock means for continuously maintaining the time of day by storing digital time signals representative of the time of day;

call received means responsive to said ring signal for automatically retrieving said stored digital time signals upon receipt of a call and for providing output digital time signals associated with the time of day at which a call was received;

speech generation means responsive to being provided said output digital time signals for generating audio speech time signals characteristic of said output digital time signals; and

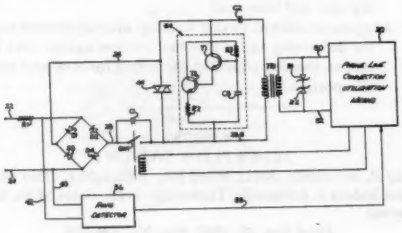
means for recording said audio time signals on said recording media contiguous to said incoming message signals to associate each message received with the time of day at which such message was received.

4,500,754

SOLID STATE OFF HOOK PHONE LINE LOAD

Richard C. Mackey, Woodland Hills, Calif., assignor to Novation, Inc., Chatsworth, Calif.

Filed Jan. 15, 1981, Ser. No. 225,310
Int. Cl.[3] H04M *1/00, 11/00*
U.S. Cl. 179—81 R 1 Claim



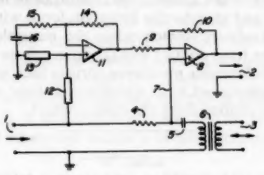
1. A solid state of hook phone line load comprising a diode bridge for coupling between a pair of phone lines to provide a predetermined polarity between a second pair of lines whereby a first line will be positive with respect to a second line, a low frequency filter consisting only of a resistor connected to said first line and a capacitor connected between said resistor and said second line, said low frequency filter being a means for providing a control signal at the junction between said resistor and said capacitor which is responsive to a DC voltage on the phone line, and a first transistor having a collector connected to said first line, a base, and an emitter connected to said second line through a resistive load, said base of said first transistor being coupled to said junction between said resistor and said capacitor through a second transistor also having an emitter, a base and a collector, said emitter of said second transistor being connected to said base of said first transistor, said base of said second transistor being connected to said junction between said resistor and said capacitor, and said collector of said second transistor being connected to said first line, whereby a relatively low impedance is imposed between said first and second lines for DC and very low frequencies and a relatively high impedance is imposed at phone line signaling frequencies.

4,500,755

ELECTRIC HYBRID CIRCUITS

Tapio H. Murto, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 20, 1981, Ser. No. 323,540
Int. Cl.[3] H04B *1/58*
U.S. Cl. 179—170 NC 9 Claims



1. An electronic hybrid circuit comprising:

an input port and an output port for connection to a 4-wire path;

a differential amplifier having an inverting input, a non-inverting input and an output coupled to the output port;

a first resistor coupled between the output and the inverting input of the differential amplifier;

a second resistor coupled between the input port and the non-inverting input of the differential amplifier;

means for coupling a 2-wire path to a junction between the second resistor and the non-inverting input of the differential amplifier;

an active state having an input, coupled to the input port, and an output; and

a third resistor coupled between the output of the active stage and the inverting input of the differential amplifier;

the active stage including amplifying means and impedance means for compensating for the impedance of the 2-wire path whereby the level of signals transmitted from the input port to the output port is controlled.

4,500,756

KEYBOARD SWITCH HAVING A DEFORMABLE MEMBRANE FORMED OF CELLULAR URETHANE

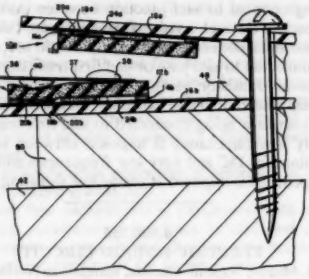
Frederick C. Feagans, Central, S.C., and Albert W. Nordquist, Ivoryton, Conn., assignors to Pratt-Read Corporation, Ivoryton, Conn.

Filed Mar. 19, 1982, Ser. No. 359,827
Int. Cl.[3] H01H *9/00*
U.S. Cl. 200—5 A 14 Claims

1. A keyboard switch having a nonresilient actuator comprising

a substrate having at least one fixed contact thereon, a deformable membrane having disposed directly thereon a movable electrically conductive coating, said coating positioned adjacent said fixed contact and adapted for movement into and out of electrical connection with said fixed contact for completing a circuit therebetween,

means for actuating said nonresilient actuator to engage and push against said deformable membrane and thereby to move said movable coating, and



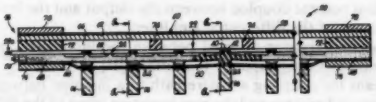
said deformable membrane being formed of mechanically frothed open cell cellular urethane foam whereby (1) upon actuation of the actuator said deformable membrane distributes and absorbs the actuation force without damage to the keyboard switch while the movable coating engages the fixed contact and (2) upon release of the actuator the deformable membrane springs back without taking a compression set to its undeformed shape retracting the movable coating from the fixed contact.

4,500,757

MOMENTARY DIGITAL ENCODING DEVICE FOR KEYBOARDS

Craig E. Rooney, Prairie Village, Kans., assignor to Engineering Research Applications, Inc., Prairie Village, Kans.

Filed Jul. 7, 1982, Ser. No. 396,039
Int. Cl.³ H01H *13/70*; G08C *9/00*
U.S. Cl. 200—5 A **22 Claims**



1. A keyboard output device, comprising:

a plurality of elongated, electrically conductive strands each having a number of axially spaced apart impact zones along the length thereof, certain of said zones being covered with electrically insulative material, to thereby render them insulated, and other of said zones being free of insulative material and thereby electrically conductive;

means mounting said strands in juxtaposed relationship with each other, and with the impact zones of certain of said strands being in proximal relationship with corresponding impact zones on other of said strands, to thereby cooperatively define a number of spaced part sets of impact zones each made up of corresponding impact zones on a plurality of said strands;

each of said impact zone sets having a characteristic, individual pattern of insulated and conductive impact zones;

an elongated, electrically conductive engagement member for each impact zone set respectively;

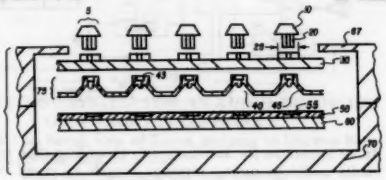
means mounting said members adjacent their associated sets, with the longitudinal axes of the members being generally transverse relative to the longitudinal axes of said strands, each of said members being selectively shiftable toward and into momentary impact engagement with at least certain of the impact zones making up the associated impact zone set, in order that said conductive impact members, upon said shifting thereof, will make momentary electrical contact with the conductive impact zones forming a part of the impact zone sets respectively associated therewith.

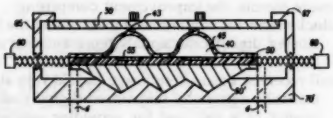
4,500,758

KEYBOARD SWITCH ASSEMBLY HAVING SENSORY FEEDBACK

Peter U. Guckenheimer, Campbell, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 5, 1983, Ser. No. 510,526
Int. Cl.³ H01H *13/70, 9/00*
U.S. Cl. 200—5 A **14 Claims**





1. A switch apparatus comprising:

membrane means having an activable switch area for providing a switch output signal in response to activation of said switch area by a predetermined stimulus;

dome means directly coupled to said membrane means, said dome means having a resiliently deformable dome-like portion having a spring force, said dome-like portion positioned in proximity to said activable switch area, said dome means for providing said predetermined stimulus to said activable switch area in response to deformation of said dome-like portion; and

adjustment means coupled to act directly on said membrane means, said adjustment means having:

a base having an inclined bottom surface;

a housing coupled to said base having an inclined upper surface for mating with said inclined bottom surface;

a displacement means coupled to said housing and said base for causing relative movement between said housing and said base; and

a keymount affixed to said housing, said adjustment means for deforming said dome-like portion against said keymount, thereby adjusting the spring force of said dome-like portion.

4,500,759

FLUID FLOW SWITCH

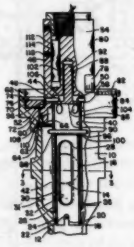
Craig R. deFasselle, 38411 Wood Rd., Willoughby, Ohio 44094, and Robert J. deFasselle, Timberidge Trail, Gates Mills, Ohio 44040

Filed Sep. 28, 1983, Ser. No. 536,694
Int. Cl.³ H01H *35/40*
U.S. Cl. 200—81.9 R **17 Claims**

1. A flow switch, comprising in combination:

a body member;

a fluid inlet defined by said body member;
a fluid outlet defined by said body member;
an outer core tube disposed within said body member and having a first and a second end;
an inner core tube disposed coaxial to and within said outer core tube and having a first and a second end;
said first ends of said inner and outer core tubes being disposed adjacent said fluid inlet;
at least one of said inner and outer core tubes being in fluid communication with said fluid inlet;
said body member defining a body flow path between said outer core tube and said body member in communication with said fluid outlet;
a first aperture defined by said inner core tube;
a second aperture defined by said outer core tube;



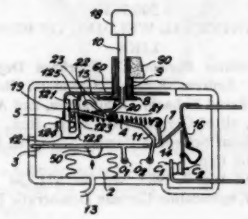
securing means for securing one of said core tubes to be non-rotatable relative to said body member;
means for rotatably mounting the other of said core tubes relative to said body member enabling said first aperture to register with said second aperture for defining a first orifice of variable size to provide a variable flow bypass path to said body flow path in accordance with the relative rotational position between said inner and said outer core tubes;
a cylindrical chamber defined by said rotatable core tube;
a piston slidably disposed within said cylindrical chamber for movement in accordance with the fluid flow through said fluid inlet; and
switch means disposed proximate said piston for providing a switching output in response to fluid flow through said fluid inlet exceeding a preselected level.

4,500,760

THERMOSTAT-CONTROLLED ELECTRIC SWITCH

Yves Malbec; Yves Boisot; Daniel Bontemps, and Georges Duhamel, all of Paris, France, assignors to Thomson-CSF, France

Filed Sep. 21, 1982, Ser. No. 420,839
Claims priority, application France, Sep. 29, 1981, 81 18348
Int. Cl.³ H01H *35/24*
U.S. Cl. 200—83 C **5 Claims**



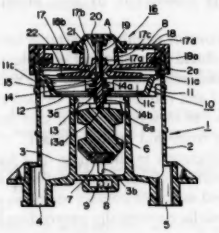
1. A thermostatic switch for a refrigerator comprising:
a housing;
a pair of switch contacts within said housing and movable between an open and closed position for causing operation of a compressor in a first position to cool said refrigerator and interrupting operation in a second position to permit said refrigerator to warm;
a first lever pivotably mounted within said housing engaging said switch contacts for moving said contacts between said positions;
a bellows engaging said first lever and containing an expandable fluid and provided with a hermetic tube acting as a thermometer for producing a force urging said first lever to pivot in a first direction so as to move said switches to said first position as said fluid expands;
a manually operable handle extending into said housing and mounted to be rotatable and movable into and out of said housing between first and second positions;
a cam mounted on said handle for rotation therewith;
a cam follower operatively associated with said cam and displaceable in response to rotation of said cam;
a spring connecting said cam follower to said first lever for urging said first lever to pivot in a direction opposite said first direction, the amount of force applied varying with the position of said cam follower and determining the force required by said bellows to cause said first lever to pivot and move said switch contacts to said first position;
a second lever pivotably mounted within said housing and engaging said handle for pivotable movement in response to movement of said handle from said first position to said second position to engage said first lever and pivot said first lever in said direction opposite said first direction to move said switch contacts to said second position, said second lever also engaging said cam follower when said handle is in said second position so that the force required by said bellows to cause said first lever to pivot and move said switch contacts to said first position is greater when said handle is in said second position and the refrigerator is defrosted when said handle is in said second position.

4,500,761

FLUID RESERVOIR WITH FLUID-LEVEL SENSOR

Hitoshi Kubota, Minami-ashigara; Seiji Hamamatsu, Kawasaki; Teluo Yambe, Yokosuka, and Toshiyuki Takahashi, Miura, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama; Tokico Ltd., Kawasaki and Nippon Air Brake Co., Ltd., Kobe, all of, Japan

Filed May 26, 1983, Ser. No. 498,476
Claims priority, application Japan, Jun. 1, 1982, 57-92103
Int. Cl.³ H01H *35/18*; G01F *1/00*; G08B *29/00, 21/00*
U.S. Cl. 200—84 C **5 Claims**



1. A fluid reservoir, comprising:
(a) a fluid retainer having an upper opening for retaining a supply of a working fluid, the quantity of said working fluid being indicated by the vertical level of said working fluid within the retainer;
(b) a float free to move vertically within the retainer and of a lower density than the working fluid;
(c) a fluid-level sensor disposed at the bottom of said retainer and sensitive to the vertical position of the float for caus-

ing a low fluid-level alarm when the float is lower than a predetermined level;

(d) a cover for removably covering the upper opening of the retainer;

(e) a first rod supported by the retainer so as to be free to move vertically between a first position permitting free vertical movement of the float and a second position causing the float to be lower than said predetermined level; and

(f) a second rod supported by and contained within the cover so as to be vertically movable manually from a third position permitting the first rod to assume the first position and a fourth position causing the first rod to assume the second position.

4,500,762

RESISTOR-TYPE DISCONNECTING SWITCH FOR CIRCUIT BREAKER

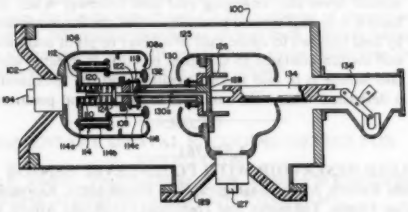
Toshiaki Yoshizumi, Minoo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 479,072

Claims priority, application Japan, Mar. 25, 1982, 57-49610

Int. Cl.³ H01H *33/16*

U.S. Cl. 200—144 AP **3 Claims**



1. A disconnecting switch, comprising:

an electrically conductive member;

an electrically conductive shield having a circular opening therein;

a main contact and an arcing contact within said shield electrically connected to said electrically conductive member;

a movable contact member insertable through said opening into said shield into physical and electrical contact with each of said main contact and said arcing contact inside said shield and retractable out of said shield through said opening so as to separate from said main contact before separating from said arcing contact;

a resistive electrode in the shape of a toroid, disposed between a portion of said shield defining said circular opening and said movable contact member, said toroid having a curved surface externally protruding beyond said opening; and

a resistor inside said shield connecting said resistive electrode to said electrically conductive member, so as to define a first current path from said movable contact member across a first gap between said movable contact member and said resistive electrode and through said resistive electrode and said resistor, said first path being electrically in parallel to a second current path across a second gap between said movable contact member and said arcing contact upon disengagement of said movable contact member from said arcing contact.

4,500,763

METHOD AND APPARATUS FOR THE PRODUCTION OF WELDED GRID BODIES

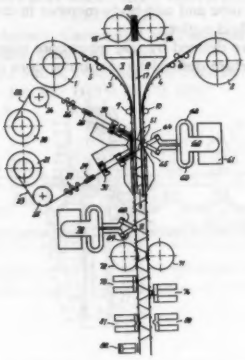
Gerhard Schmidt; Klaus Ritter, and Gerhard Ritter, all of Graz, Austria, assignors to EVG Entwicklungs- u. Verwertungs-Gesellschaft m.b.H., Graz, Austria

Filed Apr. 28, 1982, Ser. No. 372,478

Claims priority, application Austria, May 14, 1981, 2158/81

Int. Cl.³ B23K *11/32*

U.S. Cl. 219—58 **8 Claims**



6. A method of producing a welded grid body comprising two parallelgrid mat portions separated by a slab of heat insulating material, and spacer wires cut to length and welded at each end to one of said grid mat portions, said method comprising the steps of

(a) drawing off said grid mat portions from stock coils thereof;

(b) straightening said grid mat portions and aligning said grid mat portions so that they are spaced apart by a distance corresponding to the desired thickness of said welded grid body;

(c) introducing a slab of heat-insulating material into the space between said grid mat portions;

(d) simultaneously drawing a plurality of spacer wires from stock coils thereof, straightening said spacer wires, and passing said spacer wires laterally through one of said grid mat portions and said slab of heat insulating material so that each of said spacer wires lies close to both of said grid mat portions; and

(e) welding leading edges of said spacer wires to one of said grid mat portions at a first location along said production channel and welding trailing edges of said spacer wires to the other of said grid mat portions at a second location along said production channel.

4,500,764

DEVICE FOR INTERNAL WELDING OF PIPES OR THE LIKE

Erich Girodi; Günter Bornowski; Eberhard Dejmek, all of Hoyerswerda; Andreas Knabe, Bernsdorf; Roland Koch, Weisswasser; Bernd Urbach, Mühlhausen, and Arnold Weisselberg, Halle, all of German Democratic Rep., assignors to VEB Gaskombinat Schwarze Pumpe, Schwarze Pumpe, German Democratic Rep.

Filed Aug. 9, 1983, Ser. No. 521,734

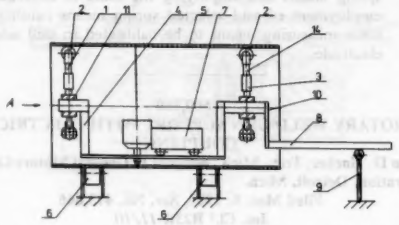
Claims priority, application German Democratic Rep., Nov. 4, 1982, 244551

Int. Cl.³ B23K *37/02, 31/06*

U.S. Cl. 219—59.1 **10 Claims**

1. A device for internal welding of elongated objects, such as pipes, tanks or the like, particularly pipes of greater diameters and lengths, comprising means for rotating an object being

welded about a central axes thereof; a car carrying welding equipment and positioned within an object to be welded; at least two subframes spaced from each other in the direction of elongation of said object and each carrying a plurality of tread rollers, said subframes being positioned within said object, said tread rollers being provided with locking means adapted to lock said tread rollers against an inner surface of said object; and at least one shaft arranged to be positioned along the



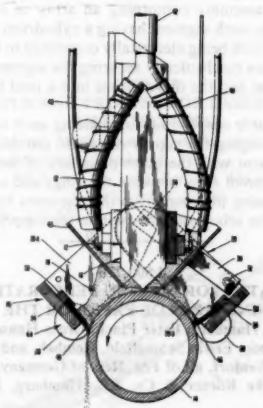
central axis of the object and pivotally mounted in said subframes, said shaft being rigidly connected to said subframes so that upon rotation of said object about the central axis thereof said car is able to pivot freely about the central axis of the object and is permanently hung downwardly by its own weight, whereby a complete welding of an internal circumferential seam of said object is produced upon a complete rotation of the object by said rotating means.

4,500,765

FLUX RETAINER

Donald J. Trotter, Carbondale, Pa., assignor to Santrade Ltd., Lucerne, Switzerland

Filed Apr. 18, 1983, Ser. No. 486,237
Int. Cl.³ B23K *9/18*
U.S. Cl. 219—73.21 **5 Claims**



1. A flux retainer for use in retaining a granular flux upon a rotating cylindrical pipe to which a metal reinforcement layer is applied by a submerged arc welder which includes a welder head and a conduit for delivering granular flux, said flux retainer comprising:

a generally rectangular frame comprising a pair of end plates and a pair of side plates;

a plurality of supports carried by said frame for supporting said frame upon an upper portion of the pipe surface as the pipe rotates about its longitudinal axis, with said end plates generally parallel to the pipe axis and said side plates extending generally perpendicular to the pipe axis;

said supports being spaced apart to engage an upper portion of the pipe surface at locations disposed above the longitudinal axis of the pipe;

arm means joined to said frame for releasably securing said frame to the welder head;

a pair of metal brushes connected to and extending across said end plates and projecting therebelow to bear against the pipe surface and resist leakage of granular flux;

said side plates each comprising a plurality of plate segments pivotably interconnected for rotation about an axis extending generally parallel to the pipe axis in order to change the angular relationship between the plate segments and vary the distance separating said end plates; and

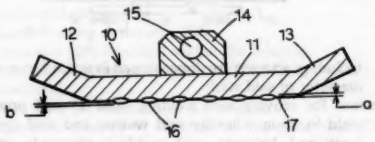
fastener means for securing said plate segments in selected angular relationships to adapt the retainer to pipes of different diameter.

4,500,766

METHOD OF FUSION OF INSERTS TO SNOW PLOW RUNNERS

Paige J. Reinhardt, St. Paul, Minn., assignor to Paper, Calmenson & Co., St. Paul, Minn.

Filed Feb. 4, 1982, Ser. No. 345,725
Int. Cl.³ B23K *9/04*
U.S. Cl. 219—76.1 **3 Claims**



1. The method of making a wear runner comprising the steps of:

forming a runner having a wear resistant surface from a first material having a predetermined melting temperature and a predetermined hardness;

selecting an insert for applying to the runner with the insert characterized by having a greater hardness than the runner and a melting temperature on the same order as the runner; and

embedding the insert into the runner approximately ¼ inch through melting of both the runner and the insert through electrical fusion of the insert to the runner so that the insert projects approximately ¼ inch from said runner.

4,500,767

SHADOW MASK WASHER/SPRING WELDING APPARATUS

Leonard P. Wilbur, Jr., Lancaster, and Marinus Van Renssen, Leola, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 27, 1983, Ser. No. 517,840
Int. Cl.³ B23K *11/10*
U.S. Cl. 219—78.01 **18 Claims**

1. A welding apparatus adapted for welding a washer to a frame retaining spring while said washer and said spring are in engagement with a stud affixed to a sidewall of a kinescope panel, said spring having an aperture for loosely receiving said stud and said washer having an aperture for snugly receiving said stud whereby said washer and said spring retain a frame at a predetermined spaced relationship within said panel, said welding apparatus comprising:

moveable carrier means for receiving said panel in a centered position and for moving said panel to a preselected weld location;

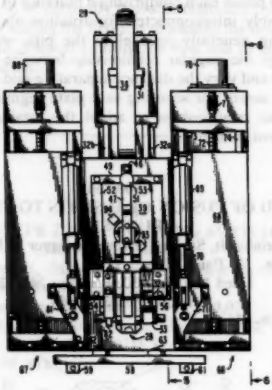
frame support means;

means for positioning said frame support means in the vicinity of said frame;

frame sensing means;

means responsive to said frame sensing means for moving said frame support means into contact with said frame whereby said frame support means supports said frame at said predetermined location;

a welding head including at least one welding electrode and at least one ground electrode, said welding electrode



including an aperture dimensioned in accordance with the diameter of said stud;

means for moving said welding head to said preselected weld location whereby said washer and said spring are positioned between said welding electrode and said ground electrode; and

means for closing said electrodes against said frame retaining spring and said washer with said aperture engaging said stud, whereby welding current can be passed through said electrodes to weld said washer to said spring.

4,500,768

ELECTRODE MOUNTING SUPPORT

Jame Rossell, Lausanne, Switzerland, assignor to Rossell Electronique SA, Switzerland

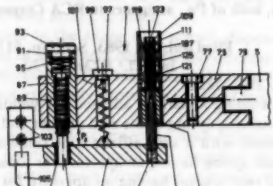
PCT No. PCT/CH81/00050, § 371 Date Jan. 8, 1982, § 102(e) Date Jan. 8, 1982, PCT Pub. No. WO81/03299, PCT Pub. Date Nov. 26, 1981

PCT Filed May 11, 1981, Ser. No. 339,441

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018426

Int. Cl.³ B23K *11/10*

U.S. Cl. 219—86.25 **5 Claims**



5. A method for adjusting the work force acting between an electrode and a workpiece to accommodate different electrode requirements in an apparatus which includes a spring means for providing said force, and force measuring means including displacement measuring means, said method comprising the steps of:

selecting a desired electrode for use;

selecting a corresponding spring means for use, said spring means being predetermined as being suitable for providing a force appropriate for use in conjunction with said electrode;

replacing a previously positioned electrode and spring means with said selected electrode and said selected spring means and employing the same in combination, employment of said selected spring means causing said force measuring means to be calibrated to said selected electrode.

4,500,769

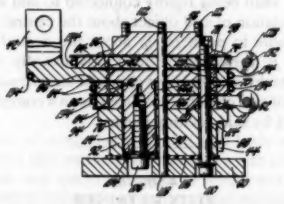
ROTARY WELD GUN SUPPORT WITH ELECTRICAL COUPLING

Jon D. Tincher, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 9, 1983, Ser. No. 473,666

Int. Cl.³ B23K *11/10*

U.S. Cl. 219—86.33 **4 Claims**



1. In a resistance welding device, means for rotatably supporting a weld gun and coupling electrical current to a weld gun comprising:

an arbor assembly rotatable about a central axis and having adaptor means for supporting a weld gun and drive means for rotatably driving the assembly;

the arbor assembly comprising an array of axially spaced segments, each segment having a cylindrical outer periphery and each being electrically connected to the weld gun, and means mechanically securing the segments, the adaptor means and the drive means into a load bearing member,

a nonrotatable supply ring surrounding each segment, and

means for urging the supply rings into intimate conductive engagement with the outer periphery of the segments to allow current flow between the rings and segments, and for releasing the rings from the segments to permit rotation of the arbor assembly within the supply rings.

4,500,770

APPARATUS FOR MAKING PERFORATIONS IN RUNNING WEBS OF PAPER OR THE LIKE

Jürgen Vock, Hamburg; Peter Pinck, Gross-Hansdorf; Norbert Lange, Glinde; Erwin Schmalfeld, Reinbek, and Kurt-Eckard Petersen, Wentorf, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,478

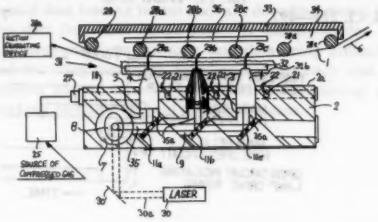
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127206

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LK **26 Claims**

1. Apparatus for perforating sheet-like material, particularly a moving wrapping material for rod-shaped articles of the tobacco processing industry, comprising a source of coherent radiation; at least one energy-directing perforating unit which is spaced apart from the material to be perforated and has a marginal portion beyond which radiant energy which is used

to make perforations and is supplied by said source propagates itself against the material with attendant separation of solid matter in the regions of impingement of radiant energy upon the material, said marginal portion having an end face and a rim surrounding said end face and said perforating unit having a passage for the propagation of radiant energy against the material to be perforated, said passage having an outlet and said rim surrounding said outlet; means for transporting the



material during impingement of radiant energy thereon; a source of pressurized gaseous fluid; and means for conveying at least one stream of gaseous fluid which is supplied by the respective source against the exterior of said portion of said perforating unit to thus reduce the likelihood of accumulation of solid matter thereon, said conveying means comprising at least one nozzle receiving fluid from the respective source and arranged to direct such fluid against at least a part of said rim.

4,500,771

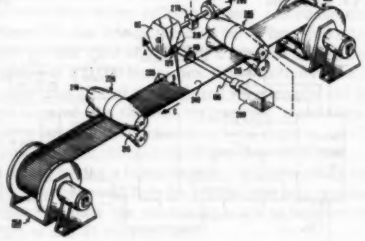
APPARATUS AND PROCESS FOR LASER TREATING SHEET MATERIAL

Richard A. Miller, North Huntingdon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 20, 1982, Ser. No. 435,443

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LH **21 Claims**



1. A process comprising:

translating ferromagnetic sheet metal;

curving said translating ferromagnetic sheet metal; and

scribing magnetic domain refining lines on the translating curved ferromagnetic sheet metal.

4,500,772

COMBINED LIQUID-COOLED ON-BOARD NETWORK GENERATOR AND HEATER FOR MOBILE VEHICLES

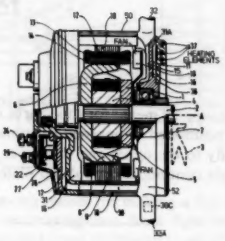
Peter Ahner, Ludwigsburg; Helmut Härer, Remseck, and Siegfried Schustek, Immenstaad, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,535

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207605

Int. Cl.³ H05B *1/00;* **H02K** *9/08*

U.S. Cl. 219—209 **19 Claims**



1. A combined on-board electric network and heat supply generator system for vehicles having engines and passenger compartments, comprising

a closed housing structures **(52)**;

an armature **(10)** mounted within the housing;

at least one alternating current coil **(13,14)** supported on the armature;

a rotor shaft **(2)** mounted in the housing;

a claw-pole rotor **(6–9)** mounted on the rotor shaft **(2)** and driven by the engine of the vehicle;

means **(19)** for circulating a cooling medium inside the housing, said cooling medium streaming over the alternating current coils **(13,14)** and the rotor;

having at least one part of the housing formed as a heat exchange element which is cooled by the cooling medium, and an externally closed heat exchange liquid circuit, including entrance and exit ports **(32,32*a*)** formed on the housing for heating the passenger compartment of the vehicle, and having a portion of the liquid circuit in heat exchange relation to the heat exchange element, and

having at least one electric heating element **(37)** mounted in at least one of the parts of the housing **(52)**, and a switch **(38,40,41,42,43)** connecting the heating element with at least one alternating current coil **(13,14)**, the heating element **(37)** being positioned in heat exchange relation with the fluid circuit.

4,500,773

METHOD AND APPARATUS FOR USE IN HEATING SHOE PARTS

Raymond Hanson, Rearsby, and Malcolm Tillyard, Leicester, both of England, assignors to USM Corporation, Farmington, Conn.

Filed Nov. 27, 1981, Ser. No. 325,384

Claims priority, application United Kingdom, Nov. 29, 1980, 8038412

Int. Cl.³ A43D *95/10;* **H05B** *1/00*

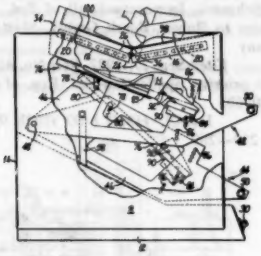
U.S. Cl. 219—215 **13 Claims**

5. An apparatus suitable for use in heating shoe parts to activate adhesive on a surface thereof, comprising:

a single continuous plate comprising a pair of articulated portions, each having upper and lower surfaces, and each having electrical heaters embedded therein which are operable to heat the plate;

control means operable to control the heaters so that they bring both the upper and lower heating surfaces of the

plate to a temperature of between 300° C. and 450° C. and maintain them substantially at that temperature; and



adjustable support means for shoe parts, on which shoe parts can be positioned in opposed relationship with and close proximity to the upper and the lower heating surfaces of the single continuous articulated plate.

4,500,774

CAR CIGAR LIGHTER

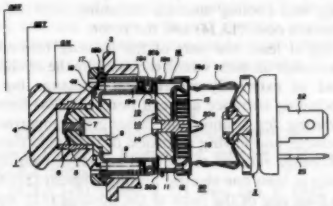
Kazumi Honjo, Tokyo, Japan, assignor to Niles Parts Company, Limited, Tokyo, Japan

Filed Jan. 5, 1984, Ser. No. 568,405

Claims priority, application Japan, Nov. 16, 1983, 58-177313[U]

Int. Cl.³ F23Q *7/00*

U.S. Cl. 219—265 **5 Claims**



1. A car cigar lighter substantially comprising a plug assembly having a knob and a socket assembly having as bimetal, wherein a flange is fitted to the front end of a cylindrical shell portion of a plug housing, said knob of the plug assembly with a ringed groove provided almost at the center of said shell portion of the plug, a ringed projection provided at a skirt portion of the shell of said plug with a heat insulating resin ring covering the periphery of the opening edge of said flange formed at the edge as an integral piece, a spring controlling the movement of the foregoing knob and supported by a spring bearing seat having one end coming in contact with the inner wall of said knob and the other end contacting the inner wall of the aforesaid ringed groove, and at a SET position, a positioning projection provided on the inner wall of a socket contacts the tip of said ringed projection to control the inserting position of the plug and, at the same time, a holder in the socket grips the outer wall of said plug with pressure, at an ON position, the outer circumference of a heater cap of the foregoing plug assembly is retained engaging with said bimetal of the socket assembly and further, at an OFF position, said plug assembly pops out because of the resilient force of said spring and because said holder in the socket comes into contact with the outer wall of said ringed projection to halt thereat.

4,500,775

METHOD AND APPARATUS FOR DETECTING AN OPEN CIRCUIT IN A GLOW PLUG GROUP FOR COMBINATION WITH A GLOW PLUG HEATING CONTROL CIRCUIT

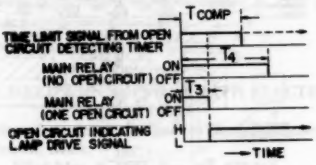
Osamu Sangu, Toyota, and Seiko Hotta, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 31, 1983, Ser. No. 480,923

Claims priority, application Japan, Apr. 2, 1982, 57-55702

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—497 **7 Claims**



1. A method for detecting an open circuit occurring in a glow plug group including a plurality of glow plugs connected in parallel, for combination with a glow plug heating control circuit for controlling the supply of electric powe to said glow plug group on the basis of an output signal indicative of a change of the composite resistance of said glow plug group produced from a detecting element connected in series with said glow plug group while detecting a heating condition of said glow plug group, after a power supply switch is turned on, comprising the steps of:

generating a heating time signal indicative of a time length in which the heating condition of said glow plug group detected by said detecting element reaches a predetermined heating condition after the start of the supply of electric power to said glow plug group initiated by the turning-on of said power supply switch;

generating a time limit signal indicative of a preset time-length starting in response to the turning-on of said power supply switch;

comparing the heating time signal with the time limit signal; and

producing an open circuit detection signal for indicating the occurrence of an open circuit in said glow plug group only when the time length indicated by the heating time signal is shorter than the preset time-length.

4,500,776

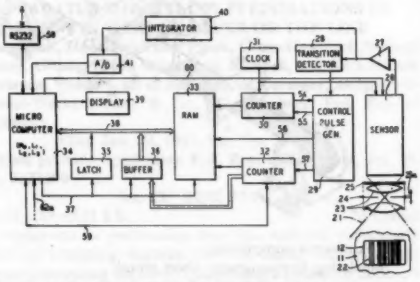
METHOD AND APPARATUS FOR REMOTELY READING AND DECODING BAR CODES

Vadim Laser, 994 Twincrest Ct., Cincinnati, Ohio 45231

Filed Nov. 8, 1982, Ser. No. 439,988

Int. Cl.³ G06K *7/10*

U.S. Cl. 235—162 **18 Claims**



1. A remote continuous bar code reading apparatus comprising:

a non-coherent light means for continuously illuminating a

bar code, said bar code being remotely disposed with respect to said camera;

a light-sensitive image sensor;

an optical means havinga rectangular aperture for focusing light reflected from said bar code onto said image sensor;

a data loading means connected to said image sensor;

a data decoding means; and

a random access memory connected to said data loading means and to said decoding means and being timeshared by said data loading means and said decoding means such that data from said image sensor is initially loaded into said random access memory, said data being utilized by said decoding means for decoding said bar code, and said random access memory subsequently functioning as a working memory for said decoding means.

4,500,777

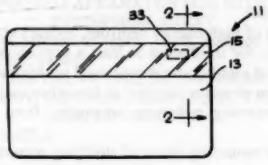
HIGH DATA CAPACITY, SCRATCH AND DUST RESISTANT, INFRARED, READ-WRITE DATA CARD FOR AUTOMATIC TELLER MACHINES

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation of Ser. No. 492,691, May 11, 1983, , which is a continuation of Ser. No. 238,833, Feb. 22, 1981, abandoned. This application Dec. 29, 1983, Ser. No. 566,966

Int. Cl.³ G06K *19/00*

U.S. Cl. 235—487 **3 Claims**



1. A system for sequentially recording transaction data by means of a laser comprising,

a wallet size card with a transparent plastic laminating material protectively bonded to a strip of high resolution direct-read-after-write reflective laser recording material adhered to one side of the card being laser recordable in place on said card and having a minimal laser recording capacity of 250,000 binary bits, the reflectivity of said strip greater than 25% at near infrared wavelengths and having laser created pits therein, representing transaction data, with a dimension of between several microns and 25 microns and with reflectivity of less than 10%, and

laser means having a beam disposed in laser writing relation with respect to said strip for writing said pits, representing transaction data, the pits having a size of between several microns and 25 microns, and

a light detector means disposed in reading relation with respect to said strip for reading said pits, and

means providing relative motion between the laser beam and the card for sequentially reading transaction data on the card and writing transaction data onto said card in a permanent manner.

4,500,778

IMAGE PLANE DEVIATION AMOUNT DETECTING DEVICE

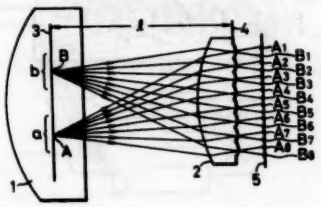
Yosuke Kusaka, Kawasaki, and Toru Fukuhara, Isehara, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 366,113, Apr. 6, 1982, abandoned. This application Jun. 4, 1984, Ser. No. 617,133

Claims priority, application Japan, Apr. 7, 1981, 56-51121

Int. Cl.³ G03B *3/10*

U.S. Cl. 250—204 **5 Claims**



1. In a device having means for making a first image and a second image by an imaging lens from light beams passing through first and second areas of the exit pupil of said imaging lens, and driving said imaging lens to be coincident with an image of an object formed by said imaging lens and a predetermined focal plane on the basis of the amount of relative displacement of said first and second images, the improvement comprising:

means for obtaining the distance between said predetermined focal plane and an imaging plane of the image of said object formed by said imaging lens from the following relation:

$$\Delta x = \frac{d \cdot l}{l \cdot \tan\theta - d}$$

where l is the distance between a plane adjacent to said exit pupil and perpendicular to the optical axis of said imaging lens and said predetermined focal plane, 2d is the amount of relative displacement of said first and second images, 2θ is the angle formed by two light rays passing from substantially the centers of the first and second areas of said exit pupil to the point of intersection between said predetermined focal plane and said optical axis, and Δx is the distance between said predetermined focal plane and said imaging plane.

4,500,779

METER ENCODING REGISTER HAVING IMPROVED ZEROING MECHANISM

Emmett D. Killingsworth, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 1, 1982, Ser. No. 353,139

Int. Cl.³ G01D *5/34;* **G06C** *15/42*

U.S. Cl. 250—231 SE **25 Claims**

21. A multiple shaft meter encoding register for a utility meter having a metering movement responsive to a metered quantity, comprising:

a frame;

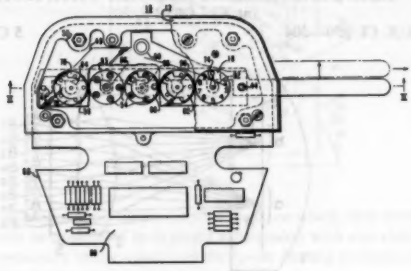
a plurality of shafts rotatably mounted in said frame;

means for generating electrical signals responsive to the angular position of said shafts, said generating means comprising a plurality of code members each fixedly mounted to a separate one of said shafts;

means for interconnecting said shafts with the associated metering movement for concurrently rotating said shafts at different predetermined rates in response to actuation by the associated metering movement;

means for releasing any of said shafts from said interconnecting means;

a plurality of shaft alignment members, each of said plurality of shaft alignment members being connected to a preselected one of said plurality of shafts in a predetermined angular relationship, each of said shaft alignment members having a fixed angular relationship to the one of said plurality of code members that is fixedly mounted to the same shaft; and



each of said plurality of shaft alignment members comprises a cam surface, said cam surface being shaped to align with a reference alignment member, said reference alignment member being operable between a first position and a second position with respect to said frame, said reference alignment member being separable from said frame.

4,500,780

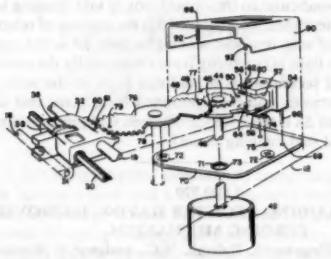
APPARATUS AND METHOD FOR ALIGNING POSTAGE METER COMPONENTS WITH AN OPTICAL SENSOR

Danilo P. Buan, Easton, and Alton B. Eckert, Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 3, 1983, Ser. No. 455,163

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—231 SE **8 Claims**



5. A setting apparatus for selecting the position of a slidable carriage which has a home position, the combination comprising: a mounting bracket having a plurality of openings therein, an optical sensor having a pair of opposed walls extending therefrom to form a channel therebetween, a pair of alignment pins extending from one side of said optical sensor, said alignment pins being received with openings of said mounting bracket, a pair of lights mounted on one of said walls on the side of said channel, a pair of photocells mounted in the second of said walls and addressing said lights, a mark located on the side of said optical sensor opposite said projections and intermediate the location of said lights, an encoder disk having a plurality of slots therein mounted on the output shaft of one stepper motor, said encoder disk having an alignment mark thereon, a stepper motor gear integral with said encoder disk, a transfer gear being in engagement with said stepper motor gear and in driving engagement with the slidable carriage, whereby upon said slidable carriage being in the home position, said optical sensor mark and said encoder disk mark will be aligned with one another.

4,500,781

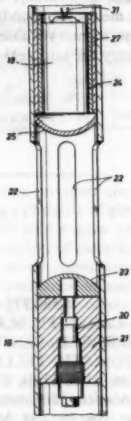
METHOD AND APPARATUS FOR DETERMINING NEUTRON CHARACTERISTICS OF BOREHOLE FLUIDS

Richard B. Culver, and Donald W. Oliver, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 28, 1982, Ser. No. 383,052

Int. Cl.³ G01V *5/10*

U.S. Cl. 250—269 **6 Claims**



1. Apparatus for evaluating the absorption cross-section of fluids within a borehole, comprising:

an elongated housing member having a cavity formed therein, said cavity being in fluid communication with said borehole;

a source of high energy neutrons, located at one end of said cavity, for irradiating at least a portion of the fluid contents of said borehole contained within said cavity;

a neutron detector, located at the other end of said cavity, for detecting radiations emanating from said irradiated fluid;

a source mounting block of shielding material substantially surrounding said source for collimating said source output into a beam of radiation traversing said cavity;

a layer of radiation shielding material substantially surrounding said detector;

a layer of radiation moderating material substantially surrounding said detector;

means for generating first electrical signals representative of the count rate of said detected radiation; and

means for converting said first electrical signals into second electrical signals functionally related to the absorption cross-section of said irradiated borehole fluid.

4,500,782

METHOD OF CALIBRATING ION CYCLOTRON RESONANCE SPECTROMETERS

Martin Allemann, Ottikon, and Hanspeter Kellerhals, Uster, both of Switzerland, assignors to Spectrospin AG, Zürich-Fällanden, Switzerland

Filed Aug. 5, 1982, Ser. No. 405,558

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131669

Int. Cl.³ H01J *49/36*; G01D *18/00*

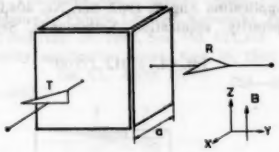
U.S. Cl. 250—291 **5 Claims**

1. A method of measuring the charge-to-mass ratio q/m of

an ionized sample substance in a cyclotron resonance spectrometer,

in which the ionized sample substance is contained in a trapped ion cell and is exposed therein to a homogeneous magnetic field of constant strength,

comprising the steps of initially introducing a known ionized



substance having a known charge-to-mass ratio into said ion cell,

measuring the first upper sideband frequency ω_R of the resonance frequency of said known ionized substance,

deriving the calibration factor B of the spectrometer by introducing the known value of q/m and the measured value of ω_R into the approximate relation

$$\frac{q}{m} = \frac{\omega_R}{B};$$

thereafter introducing an unknown sample substance into said cell,

measuring the first upper sideband frequency ω_R of the resonance frequency thereof,

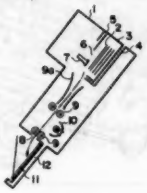
and deriving the unknown value of q/m by introducing the measured value of ω_R and the calibration value of B into the same approximate relation.

4,500,783

NOISE ERASING APPARATUS FOR STIMULABLE PHOSPHOR SHEET

Hisatoyo Kato, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 18, 1982, Ser. No. 434,884
Claims priority, application Japan, Oct. 21, 1981, 56-168119
Int. Cl.³ G03C 5/16
U.S. Cl. 250—327.2 **11 Claims**



1. In an arrangement wherein stimulable phosphor sheets for use in a radiation image recording and reproducing system are taken up one at a time out of a stimulable phosphor sheet reservoir containing stimulable phosphor sheets and each is loaded into a cassette used for the recording of a radiation image,

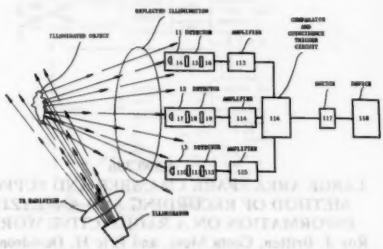
a noise erasing apparatus for stimulable phosphor sheets comprising an irradiation means for emitting noise erasing light, which is provided between the aperture of said stimulable phosphor sheet reservoir from which said stimulable phosphor sheets are taken up and the section at which said stimulable phosphor sheets are loaded into said cassettes, said irradiation means having an exposure amount of 500,000 lx.sec. or more.

4,500,784

AUTOMATIC HUMAN BODY DETECTOR

Michael Hacskaylo, 3327 Prince Charles Ct., Falls Church, Va. 22044

Filed Sep. 29, 1982, Ser. No. 428,072
Int. Cl.³ G01J 5/00
U.S. Cl. 250—341 **4 Claims**



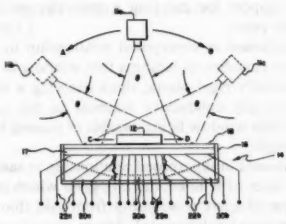
1. A method of identifying an object as that of a human body by illuminating the object with infrared radiation and detecting specific bands of reflected radiation from said object, whereby the simultaneous coincidence of specific bands of reflected radiation defines the signature of the detected object as that of a human body.

4,500,785

RADIATION DETECTOR HAVING A MULTIPLICITY OF INDIVIDUAL DETECTING ELEMENTS

Nathan R. Whetten, Burnt Hills, and John E. Kelley, Albany, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 26, 1982, Ser. No. 382,329
Int. Cl.³ H01J 47/06
U.S. Cl. 250—385 **14 Claims**



1. A radiation detector fixedly positioned relative to the location at which an object to be examined is to be located, and used with a radiation source movable to each sequential one of a plurality N of different positions relative to the fixedly-positioned radiation detector, said detector converting differentially-absorbed radiation from said movable source to electrical signals, comprising:

a housing having a cavity;

a medium contained within said cavity for conversion of radiation quanta to charged particles;

means within said cavity for establishing a plurality N of electric fields; and

a plurality N of different linear detector arrays each located in a plane parallel to and spaced from the plane of all other arrays and each having a multiplicity of elongated detector elements, each detector element in a particular one of said arrays being disposed substantially coplanar with all other detector elements of that array and with the elongated direction thereof substantially directed at the associ-

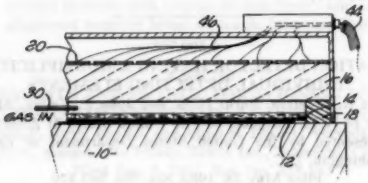
ated one of said plurality N of locations of said source, each detector element cooperating with only one associated different one of said plurality of field-establishing means for collection of charged particles formed in an associated portion of said cavity to provide an associated one of said electrical signals.

4,500,786

LARGE AREA SPARK CHAMBER AND SUPPORT, AND METHOD OF RECORDING AND ANALYZING THE INFORMATION ON A RADIOACTIVE WORK PIECE

Roy J. Britten, Costa Mesa, and Eric H. Davidson, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 21, 1982, Ser. No. 370,333
Int. Cl.³ G01T *1/185*
U.S. Cl. 250—389 **18 Claims**



1. A novel large area spark chamber and support comprising:

(a) a support for carrying a generally planar radioactive work piece;

(b) positioned in superposed relationship to said support a spark chamber including a thin window in the form of an essentially rigid plastic sheet carrying a thin layer of an electrically conductive material on the surface thereof, said thin window being capable of passing beta rays therethrough;

positioned in superposed relationship to said thin window, a layer of semi-conducting glass which is maintained in spaced-apart relationship from said thin window by a resilient insulating seal to form an enclosed gas retaining chamber between the layer of semi-conductive glass and said thin window; and

an electrically conducting surface adhered to the upper surface of said layer of semi-conducting glass, said electrically conducting surface being in the form of a series of generally uniform parallel strips;

(c) mechanical means for moving said spark chamber toward and away from said support;

(d) means for maintaining a desired predetermined gas composition within said spark chamber;

(e) an electrically conductive path between said thin layer of electrically conductive material on said thin window and said electrically conducting surface on said semiconducting glass, said path including a high voltage supply;

(f) means for detecting the location of sites of impingement of radiation on said electrically conducting surface of said semi-conducting glass; and

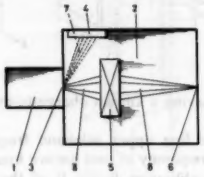
(g) means for recording and analyzing the information present in the work piece.

4,500,787

METHOD AND A DEVICE FOR FURNISHING AN ION STREAM

Jan B. Le Poole, Voorschoten, and Pieter Kruit, Amsterdam, both of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Continuation of Ser. No. 187,525, Sep. 15, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 404,044
Claims priority, application Netherlands, Sep. 17, 1979, 7906913
Int. Cl.³ H01J *27/00*
U.S. Cl. 250—427 **8 Claims**



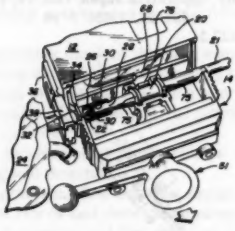
1. A method for furnishing an ion stream by causing gas to flow through a discharge aperture having a diameter of at most 20 μm into an evacuated chamber and ionizing said gas by means of one or a plurality of focused electron beams downstream of said aperture characterized in that the ionization is effected at the location where the diameter of the gas stream is the smallest immediately downstream of said discharge aperture.

4,500,788

DEVICE FOR PROVIDING ANTIBACTERIAL RADIATION

Ralph Kulin, Marengo; Daniel B. Granzow, Ingleside, and Brant R. Danielsen, Round Lake Beach, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 19, 1983, Ser. No. 524,704
Int. Cl.³ A61L *2/10*; A61M *31/00*
U.S. Cl. 250—455.1 **22 Claims**



1. In apparatus for automatically connecting and disconnecting a pair of connectors, including a housing; means within said housing for providing radiation for antibacterial effect therein; first and second means for respectively holding said connectors, said first and second means being relatively movable between first and second positions, to cause connectors carried in the first and second means to be separated from each other in the first position, and to cause said carried connectors to be joined together in the second position; rack and gear means for relatively moving said first and second means between said first and second positions, the gear of said rack and gear means defining gear teeth of increasing pitch from its center of rotation about at least a portion of its periphery, the rack of said rack and gear means defining mating teeth correspondingly

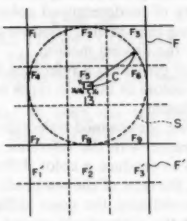
spaced along its length in positions to permit relatively linear motion between said rack and gear as the gear rolls along the rack, whereby the mechanical advantage of the rack and gear means varies with the position of the gear along the rack.

4,500,789

ELECTRON BEAM EXPOSING METHOD

Yasutaka Ban, Yokohama, and Toshihiko Osada, Ebina, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 25, 1982, Ser. No. 411,316
Claims priority, application Japan, Aug. 26, 1981, 56-134598
Int. Cl.³ A61K *27/02*
U.S. Cl. 250—492.2 **3 Claims**



1. An electron beam exposing method for projecting an electron beam, having an accerleration voltage, onto a desired region of a resist layer having a predetermined region having an area and having patterns, comprising the steps of:

(a) setting the acceleration voltage of the electron beam to a value at which a distribution of scattered electrons in the predetermined region of the resist layer is substantially uniform;

(b) projecting the electron beam onto the resist layer at an exposure dosage determined according to a ratio between a total area of the patterns onto which the electron beam is projected in the predetermined region with respect to the area of the predetermined region, said projecting step comprising the substeps of:

(i) determining an exposure dosage time in dependence upon a dose amount and an electron beam current;

(ii) calculating a correction factor to obtain a corrected exposure dosage time, comprising the substeps of:

(aa) determining a radius and center for a circle including the patterns;

(bb) calculating a sum of the areas of the patterns in the circle; and

(cc) calculating the correction factor for the exposure dosage time in dependence upon electrons reflected from the entire surface of the resist layer, the radius of the circle and the sum of the areas of the patterns in the circle; and

(iii) correcting the exposure dosage time in dependence upon the correction factor to obtain the corrected exposure dosage time.

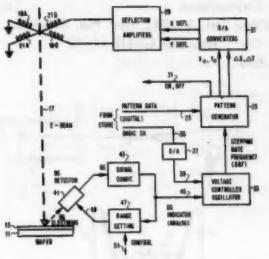
4,500,790

SYSTEM FOR IMPROVING THE UNIFORMNESS OF PATTERNS GENERATED BY ELECTRON BEAM LITHOGRAPHY

Erwin Bretscher, Rapperswil, and Peter Vettiger, Langnau am Albis, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1982, Ser. No. 435,174
Claims priority, application European Pat. Off., Nov. 30, 1981, 81110007.2
Int. Cl.³ G01N *23/00*
U.S. Cl. 250—492.2 **7 Claims**

1. A method of improving the uniformness of patterns generated by electron beam lithography in a covering layer over a substrate or base layer, comprising the steps of; generating an indication signal of the quantity of backscattered electrons obtained during electron beam exposure; applying a control signal as a function of said indication signal for adjusting the electron beam stepping rate such that the exposure dose per unit length is kept substantially constant despite variations in the material or topography of the substrate or base layer, and obtaining prior to an exposure process, an offset value and a



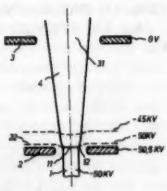
gain value of at least one backscatter detector to obtain the indication signal; said offset and gain values selected by the steps of prescanning a sample comprising two materials having the largest expected difference in backscatter characteristics, and individually adjusting during said prescanning the offset value and the gain value until the indication signal used for controlling the stepping rate remains within given limits.

4,500,791

HIGH STABILITY ELECTRON BEAM GENERATOR FOR PROCESSING MATERIAL

Siegfried Beisswenger, Preetz, Fed. Rep. of Germany, assignor to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

PCT No. PCT/DE80/00086, § 371 Date Feb. 8, 1982, § 102(e) Date Feb. 8, 1982, PCT Pub. No. WO81/03579, PCT Pub. Date Dec. 10, 1981
PCT Filed Jun. 7, 1980, Ser. No. 348,064
Int. Cl.³ H01J *3/02, 37/063*
U.S. Cl. 250—493.1 **6 Claims**



1. An electron beam generating system comprising a heated cathode, a perforated anode spaced from said cathode, an auxiliary electrode surrounding the cathode and the electron beam shape and the beam intensity are determined because a slightly more negative constant voltage is applied to the auxiliary electrode than is applied to the cathode, means for controlling the heating of the cathode to a constant temperature, including means for measuring the actual emission current of

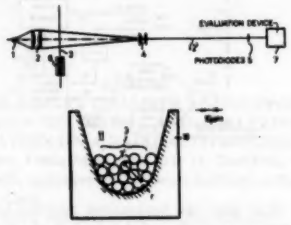
the cathode and supplying an output to said means for controlling the heating current of the cathode.

4,500,792

APPARATUS FOR CONTROLLING THE TITER OF SYNTHETIC FIBER TOWS

Kurt Aeppli, Uster, Switzerland, assignor to Zellweger Uster Ltd., Uster, Switzerland

Filed Jul. 2, 1982, Ser. No. 394,765
Int. Cl.³ G01B 11/10
U.S. Cl. 250—560 **9 Claims**



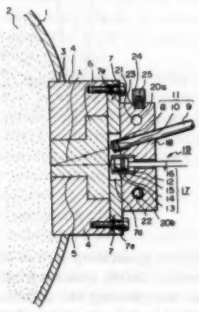
1. An apparatus for controlling the titer of synthetic fiber tows, comprising light source means for projecting a light beam along a beam path through which at least one fiber tow is passed; photosensitive receiver means for receiving said light beam after it passes said tow, including at least one row of a predetermined number of photodiode elements upon which the shadow projected by the tow impinges and leaves unexposed to the light beam a number of photodiode elements indicative of the cross section of the tow; means for orienting the fibrils of said tow at least in the area of said beam path so as to provide said tow with a regular cross section at least along the length thereof which is intercepted by said light beam; and evaluation means responsive to said receiver means for producing an output signal to control the titer of the tow being formed on the basis of the detected cross section of the tow.

4,500,793

APPARATUS FOR MONITORING INSIDE OF TREATING COLUMN

Kenji Kuramoto, Atsugi, Japan, assignor to Ebara Corporation, Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 348,084
Int. Cl.³ G01N 15/06
U.S. Cl. 250—574 **15 Claims**



1. An apparatus for monitoring the interior of a treating column containing two types of materials, said apparatus comprising:

a viewing window provided on a side wall of the column;

a color sensor having a light projecting portion placed to face the window for projecting light to materials in an area within the column to be monitored through the viewing window and a light reception portion for receiving a light reflected from the materials and converting the light to a reflection signal corresponding to the color of the materials;

driving means for driving the color sensor to move along the viewing window whereby the movement of the color sensor produces a scanned reflection signal indicating the color profile of the materials;

position sensing means for successively producing position signals each indicating the passing of the color sensor by one of a plurality of predetermined color detection positions spaced along the viewing window as the color sensor is moved by the driving means;

reference means for providing a reference signal for differentiation of the colors of the two types of materials contained in the column;

means for comparing the scanned reflection signal from the moving color sensor with the reference signal from the reference means to produce a color difference signal for identification of the type of the materials; and

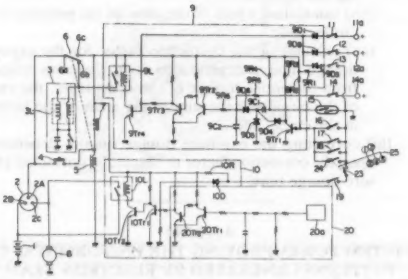
means for position-defining the color difference signal in accordance with the successively sensed position signals from the position sensing means to develop a series of color difference samples each identifying the type of materials dominantly present at one of the successive detection areas within the column and spaced generally in the vertical axis thereof, whereby said series of samples indicates the distribution of the materials over the vertically scanned areas within the column.

4,500,794

APPARATUS FOR AUTOMATICALLY STARTING AND STOPPING ENGINE

Isao Hamano; Akira Morishita; Yoshifumi Akae, and Toshinori Tanaka, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1983, Ser. No. 555,679
Claims priority, application Japan, Dec. 2, 1982, 57-183862[U]; Dec. 2, 1982, 57-183863[U]; Dec. 2, 1982, 57-183864
Int. Cl.³ H02P 9/04
U.S. Cl. 290—38 C **3 Claims**



1. An apparatus for automatically starting and stopping an engine comprising:

a clutch switch for detecting that the depression of a clutch pedal of a vehicle is completely performed,

a neutral switch for detecting the neutral position of a transmission,

a vehicle speed sensor for generating a travel signal by detecting the travel of the vehicle,

condition detecting means for detecting the operation maintaining condition of the engine, and

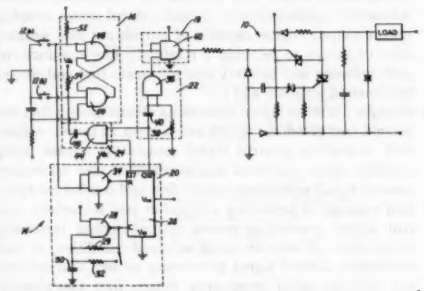
control means for automatically stopping the engine by interrupting the energization of an ignition circuit when receiving a detection signal of said neutral switch and not receiving the detection signals of said vehicle speed sensor and said condition detecting means and automatically starting the engine by energizing the ignition circuit and a starter when receiving a detection signal of said clutch switch and not receiving the detection signals of said neutral switch, said vehicle speed sensor and said condition detecting means.

4,500,795

ELECTRICAL TIMING CONTROL SWITCH

Peter A. Hochstein, 14020 Fifteen Mile Rd., Sterling Heights, Mich. 48077, and Kelvin Shih, 908 Devonshire Rd., Brighton, Mich. 48116

Filed Sep. 30, 1982, Ser. No. 430,832
Int. Cl.³ H05B 37/02
U.S. Cl. 307—141 **7 Claims**



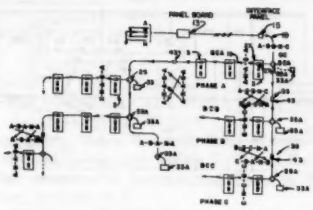
1. An electrical timing circuit for controlling the activation and deactivation of an electrical load comprising: a manually operable on-off control means, switch means having an on-state for placing the load in an activated mode and an off-state for placing the load in a deactivated mode, circuit means responsive to operation of said control means for placing said switch means in said on-state a predetermined time period and in said off-state upon the expiration of said predetermined time period and for momentarily placing said switch means in said off-state for a warning time period prior to said expiration of said predetermined time period so that momentary deactivation of the load indicates impending expiration of said predetermined time period and for reinitiating said predetermined time period in response to operation of said control means, said circuit means including a signaling circuit responsive to operation of said control means and having on and off modes for placing said switch means in said on-state when in said on mode and for placing said switch means in said off-state when in said off mode, a timing circuit responsive to operation of said control means for providing a plurality of time spaced signals to establish said predetermined and warning time periods respectively, and a transfer circuit for transferring said signaling circuit to said off mode during said warning time period and at said expiration of said predetermined time period in response to said time spaced signals, said signaling circuit including a set-reset circuit responsive to input signals from said control means and said transfer circuit for alternatively establishing on and off output signals and during said predetermined time period and for reestablishing said predetermined time period upon initial operation of said control means during the period between the initiation of said warning period and the expiration of said predetermined time period.

4,500,796

SYSTEM AND METHOD OF ELECTRICALLY INTERCONNECTING MULTIPLE LIGHTING FIXTURES

Murray L. Quin, deceased, late of Tupelo, Miss. (by Dorothy L. Quin, administratrix), assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 13, 1983, Ser. No. 494,257
Int. Cl.³ H05B 37/00
U.S. Cl. 307—147 **19 Claims**



1. An electrical interconnect system for multiple lighting fixtures comprising:

a source of three phase alternating current electrical power;

a plurality of lighting fixtures;

a first switching cable assembly between said power source and successive lighting fixtures;

a plurality of power cables, each cable having a first, a second, a third, a fourth, and a fifth lead, one of said power cables extending from said power source to said first switching cable assembly;

said first switching cable assembly having internal circuit connections for connecting a first series of lighting fixtures to at least said first, second, and fourth leads with said fixtures of said first series of fixtures being energized by at least a first phase of said three phase electrical power;

a first switch connected to said first switching cable assembly for selectively energizing and de-energizing said first series of lighting fixtures;

a second switching cable assembly electrically connected to said first switching cable assembly via others of said power cables;

means between said first and second switching cable assemblies for cross-connecting the leads of said power cables from said first switching cable assembly to said cross-connecting means with other leads in said power cables from said cross-connecting means to said second switching cable assembly such that said first lead from said first switching cable assembly becomes the third lead to said second switching cable assembly, said third lead from said first switching cable assembly becomes said fifth lead to said second switching cable assembly, and said fifth lead from said first switching cable assembly becomes said first lead to said second switching cable assembly;

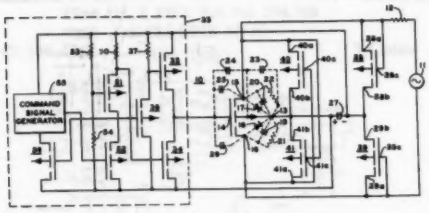
said second switching cable assembly having internal circuit connections for connecting a second series of lighting fixtures to said third, second and fourth leads relative to said first switching cable assembly with the lighting fixtures of said second series of lighting fixtures being energized by a second phase of said three phase electrical power; and

a second switch connected to said second switching cable assembly with said first switch being operable to control energization and de-energization of said first series of fixtures without interference with the operation of said second series of lighting fixtures and with said second switch being operable to control energization and de-energization of said second series of lighting fixtures without interference with the operation of said first series of lighting fixtures.

4,500,797
ALTERNATING POLARITY POWER SUPPLY CONTROL APPARATUS

Ikuo Nishimoto, Hennepin County, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 26, 1979, Ser. No. 33,585
Int. Cl.³ H03K *3/01*
U.S. Cl. 307—296 R **57 Claims**



1. An electronic switching circuit for controlling transfer of electrical power from an electrical power supply means to a load means, said switching circuit comprising:

a primary control means having first and second terminating regions and having a control region therein by which said primary control means is capable of being directed to effectively provide a conductive path of a selected conductivity between said primary control means first and second terminating regions, said primary control means first terminating region being electrically connected to a first terminal means adapted for electrical connection to a first circuit portion arrangement which includes both said electrical power supply means and said load means, and said primary control means second terminating region being electrically connected to a second terminal means adapted for electrical connection to said first circuit portion arrangement;

a rectifying means having first and second alternating polarity regions and having first and second constant polarity regions such that said rectifying means is capable of providing a constant polarity voltage between said first and second constant polarity regions if supplied with an alternating polarity voltage between said first and second alternating polarity regions, said first alternating polarity region being electrically connected to said first terminal means and said second alternating polarity region being electrically connected to said second terminal means;

an energy storage means having first and second polarity regions between which said energy storage means is capable of providing electrical energy storage, said energy storage means first polarity region being electrically connected to said first rectifying means first constant polarity region and said energy storage means second polarity region being electrically connected to said rectifying means second constant polarity region;

a primary control signal generating means having first and second energization regions and an output region, said primary control signal generating means being capable, upon electrical energization of said primary control signal generating means first and second energization regions, of providing a signal at said primary control signal generating means output region indicating occurrence of one or more selected conditions in said primary control signal generating means, there being one of said primary control signal generating means first and second energization regions electrically connected to one of said rectifying means first and second constant polarity regions;

a control signal coupling means having at least a first input region and a first output region, and which permits, at least selectively, communication to said control signal coupling means first output region concerning signals occurring at said control signal coupling means first input region, said first control signal coupling means first input region being electrically connected to said primary control signal generating means output region and said control signal coupling means output region being electrically connected to said primary control means control region;

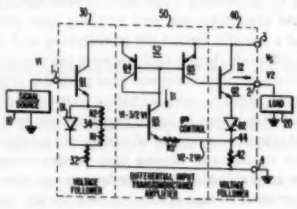
a power conservation means having first and second terminating regions and having a control region therein by which said power conservation means is capable of being directed to effectively provide a conductive path of a selected conductivity between said power conservation means first and second terminating regions, said power conservation means first terminating region being electrically connected to that one of said primary control signal generating means first and second energization regions opposite that one connected to one of said rectifying means first and second constant polarity regions as aforesaid, said power conservation means second terminating region being electrically connected to that one of said rectifying means first and second constant polarity regions opposite that one connected to one of said primary control signal generating means first and second energization regions as aforesaid, and said power conservation means control region being electrically connected to said control signal coupling means in such a manner that no substantially conductive path will occur between said power conservation means first and second terminating regions whenever a signal appears at said control signal coupling means output region capable of permitting said primary control means to provide a relatively low conductivity path between said primary control means first and second terminating regions; and

a secondary control signal generating means having first and second energization regions and having an output region, said secondary control signal generating means being capable, upon electrical energization of said secondary control signal generating means first and second energization regions, of providing a signal at said secondary control signal generating means output region indicating occurrence of one or more selected condition in said secondary control signal generating means, said secondary control signal generating means first energization region being electrically connected to said rectifying means first constant polarity region and said secondary control signal generating means second energization region being electrically connected to said rectifying means second constant polarity region, said secondary control signal generating means output region being electrically connected to said signal coupling means in such a manner that the occurrence of a substantially conductive path between said primary control means first and second terminating regions can be ended by said one or more conditions occurring in said secondary control signal generating means.

4,500,798
DIODE SIMULATOR CIRCUIT

Winthrop S. Pike, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,138
Int. Cl.³ H03K *3/26*; G06G *7/12*
U.S. Cl. 307—317 R **20 Claims**



19. In combination:

first means for providing a signal voltage and a load voltage which may differ from said signal voltage;

second means for translating said voltages by unequal amounts;

third means responsive to the translated voltages to provide an output current when the difference between said signal and load voltages is of a given polarity and exceeds a given value, said value being equal to a fraction, less than unity, of the threshold voltage of a semiconductor device in said second means, said output current being substantially zero otherwise; and

fourth means for applying said output current to said first means in a sense to reduce said difference.

4,500,799

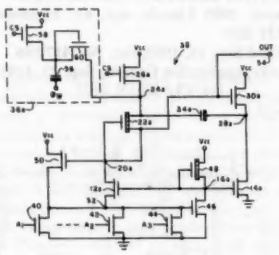
BOOTSTRAP DRIVER CIRCUITS FOR AN MOS MEMORY

Rahul Sud, Colorado Springs, and Kim C. Hardee, Manitou Springs, both of Colo., assignors to Inmos Corporation, Colorado Springs, Colo.

Filed Jul. 28, 1980, Ser. No. 172,766

Int. Cl.³ H03K *19/094, 17/284, 17/10, 19/017*

U.S. Cl. 307—449 **29 Claims**



1. An address decoder comprising, in combination,

first and second enhancement mode field effect transistors each having a gate connected for receiving a digital input signal which varies between high and low levels, said transistors being connected to turn on and off in response to high and low levels, respectively, of the input signal;

a high impedance field effect transistor having its gate coupled to its source and its source coupled to the drain of said first transistor so as to define a first node at their mutual connection;

a low impedance field effect transistor having its drain coupled to a source of operating voltage and its source coupled to the drain of said high impedance transistor to define a second node between said high impedance transistor and said low impedance transistor, the latter transistor receiving a voltage at its gate for coupling a high level voltage to said second node;

a third enhancement mode field effect transistor having its drain coupled to a source of operating voltage, having its source coupled to the drain of said second enhancement mode transistor to define a third node thereat, and having its gate coupled to said first node; and

a capacitor connected between said second and third nodes such that, when the input signal goes low, said first and second enhancement mode transistors turn off, said first node is pulled high, said third enhancement mode transistor turns on, said third node is pulled high, the voltage transition at said third node is capacitively coupled to said second node and via said high impedance transistor back to the gate of said third enhancement mode transistor so as to increase the conduction in said third enhancement mode transistor and pull said first and third nodes to a high level for use as one or more inverted output signals;

a plurality of grounded-source field effect transistors whose gates are connected to receive memory address signals and whose drains are coupled to a common node;

means for coupling said common node to the source of said first enhancement mode field effect transistor; and

transistor means coupled to said common node for inverting the signal thereat and for coupling the latter inverted signal as a delayed input signal to the gates of said first and second enhancement mode transistors such that said second transistor remains momentarily conductive to provide a discharge path for said third node in response to a low level memory address signal in order to maintain a differential voltage across said capacitor.

4,500,800

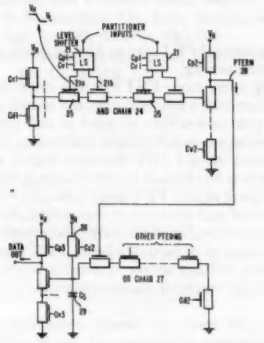
LOGIC PERFORMING CELL FOR USE IN ARRAY STRUCTURES

Moises Cases, Delray Beach; Wayne R. Kraft; William L. Stahl, Jr., both of Coral Springs, and Nandor G. Thoma, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1982, Ser. No. 413,043

Int. Cl.³ H03K *19/017, 19/096, 17/16, 19/177*

U.S. Cl. 307—468 **4 Claims**



1. In a programmed logic array structure having successive stages for performing bit partitioning, logical ANDing and logical ORing operations, with serially chained FET devices in the ANDing and ORing stages, the improvement for speeding up transfers of charges representing bits of information through said structure without loss of operational integrity comprising:

level shifting circuit means contained in said bit partitioning stages for reducing voltage swings occurring at transfer interfaces between outputs of respective bit partitioning stages and inputs to corresponding FET device chains in said ANDing stages, thereby reducing magnitudes of spurious charge coupling effects produced at the devices in said ANDing stages while also facilitating fast clearing of charges previously accumulated by devices in said ANDing stages;

charge reinforcing circuit means coupled to outputs of FET device chains in said ORing stages for sustainably reinforcing charge conditions acquired and held in respective device chains during transfers of outputs of said ORing stage; and

clocking circuit means providing a plurality of coordinated and cyclically repetitive timing control signals to said array stages for causing device chains in said stages to charge and discharge in a predetermined "tightly coordinated" manner, whereby charges representing information bits are moved successively and rapidly through devices in said partitioning, ANDing and ORing stages, and yet devices in said device chains in said ANDing and ORing stages are effectively kept isolated from spurious

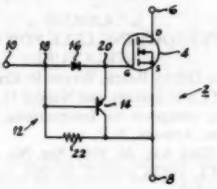
charge conditions created by transitional discharging and charging actions occurring at devices in respective preceding stages.

4,500,801

SELF-POWERED NONREGENERATIVE FAST GATE TURN-OFF FET

William J. Janutka, West Allis, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,481
Int. Cl.³ H03K *17/04, 17/687*
U.S. Cl. 307—570 **4 Claims**



1. A fast turn-off FET circuit having drain, source and gate terminals, comprising;

an enhancement mode FET having a drain connected to said drain terminal, a source connected to said source terminal, and a gate operatively coupled to said gate terminal;

nonregenerative switch means comprising transistor means connected to said FET gate and source and driven into conduction by residual stored charge in the gate to source capacitance of said FET upon turn-off of the latter due to removal of gate drive, such that conduction of said switch means provides faster discharge therethrough of said FET gate, whereby to facilitate faster FET turn-off;

gate biasing voltage source means for supplying gate drive to said gate terminal for carrying gate drive to said FET gate;

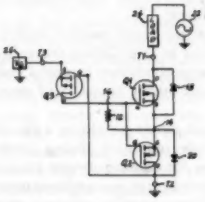
wherein said transistor means comprises auxiliary FET means connected between said gate of said first mentioned FET and said source of said first mentioned FET, and biased OFF in response to gate drive to said first mentioned FET to prevent draining of said gate drive away from said first mentioned FET.

4,500,802

THREE TERMINAL BIDIRECTIONAL SOURCE TO SOURCE FET CIRCUIT

William J. Janutka, West Allis, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,472
Int. Cl.³ H03K *17/04, 17/66*
U.S. Cl. 307—571 **15 Claims**



1. A bidirectional FET circuit comprising:

first and second enhancement mode FETs connected source to source in series relation between first and second power switching terminals, current conduction in one direction traversing through the series connection of the drain-source current path of said first FET and the forward biased substrate-drain pn junction of said second FET, and current conduction in the opposite direction traversing through the series connection of the drain-source current path of said second FET and the forward biased substrate-drain pn junction off said first FET; and

current source means for supplying a constant fixed level of current independent of input voltage, and including resistance means, connected to the gates of said FETs for driving them into conduction;

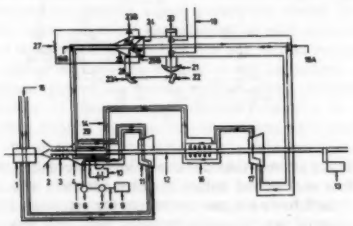
wherein said resistance means comprises a resistor having one end connected to a node connecting said FET sources, and having the other end connected to a node connecting said current source and a node connecting said FET gate, such that the gate to source potential for each FET is the product of the current through said resistor from said current source means and the resistance value of said resistor, regardless of the polarity of the corresponding power switching terminal.

4,500,803

SELF INDUCED LASER MAGNETOHYDRODYNAMIC (MHD) ELECTRIC GENERATOR

James C. Hayes, 1900 Lincoln Apt. 62, Montreal, Quebec, Canada H3H 1H7

Filed Sep. 14, 1982, Ser. No. 417,886
Claims priority, application Canada, Sep. 23, 1981, 393713
Int. Cl.³ H02N *4/02*
U.S. Cl. 310—11 **11 Claims**



1. In a magneto-hydrodynamic electric generator of the type comprising:

a laser light source generating a laser light capable of photo-ionizing a gas;

means for passing said photo-ionized gas through a magnetic field to produce electricity between a pair of electrodes perpendicular to the flow of gas and to the magnetic field, and

means for recycling the gas having passed through the magnetic field, thereby making said gas to flow through the generator in a closed cycle,

the improvement:

wherein the MHD generator further comprises a heat-exchanger for heating the gas prior to passing through the electrodes, and a compressor for circulating the gas through the closed cycle;

wherein the laser light source is a gas laser;

wherein the gas of said gas laser is the one flowing through the generator and its magnetic field; and

wherein said gas laser comprises a divergent nozzle forming part of the closed cycle to make the gas passing therethrough to laser by expansion, a radio frequency generator to make the gas to laser by electric stimulation, and an optical system for collecting the laser light and focusing it onto the flow of gas upstream the electrodes and magnet field,

said optical system including a first pair of mirrors upstream and downstream the gas flow respectively, for

focusing the laser light in the axial direction of the gas flow, an optical sub-system for collecting the laser light in a direction transversal to the gas flow and another pair of focusing mirrors for focusing the laser light collected by the sub-system in a direction transversal to the gas flow.

4,500,804

SMALL ELECTRIC MOTOR

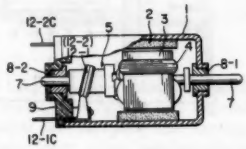
Takeshi Akiyama, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Japan

Filed Oct. 7, 1982, Ser. No. 433,365

Claims priority, application Japan, Oct. 28, 1981, 56-160602[U]

Int. Cl.³ H02K *13/06*

U.S. Cl. 310—40 MM **5 Claims**



1. A small electric motor having a permanent magnet, a rotor having a shaft, a commutator fixedly fitted to the rotor shaft and having a lubricant coated on a contact surface thereof, and brushes for making sliding contact with said commutator, characterized in that said brushes are disposed at a predetermined angle of from 5° to 30° with respect to the direction normal to said shaft, each of said brushes comprising a single-piece slide contact portion and a brush arm; said slide contact portion being bent to said predetermined angle with respect to the direction normal to said shaft and having a V-shaped cross-section.

4,500,805

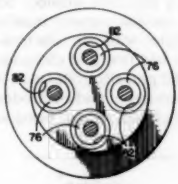
ELECTROMECHANICAL LINEAR ACTUATOR

Richard G. Swanson, West Hartford, Conn., assignor to Esco Design, Inc., West Hartford, Conn.

Filed Feb. 7, 1984, Ser. No. 577,864

Int. Cl.³ H02K *7/06*

U.S. Cl. 310—80 **10 Claims**



1. An electromechanical linear actuator comprising an electric motor adapted for connection with a source of electrical power and having a rotary mechanical output element, rotary mechanical motion transmission means connectable with the electric motor output element and operated thereby and in unison therewith, an elongated housing having one end portion open and in communication with said motor transmission means and an opposite end portion remote therefrom, an elongated lead screw disposed within said housing and having one end portion at said one end portion of the housing in operative connection with and rotatably driven by said motion transmission means, first and second bearing means in said housing respectively at said one and opposite end portions thereof supporting said lead screw for rotation by said motion transmission means, means retaining said lead screw against axial movement relative to said bearing means and housing, a drive nut operatively associated with and about said lead screw for axial movement therealong in one and an opposite direction in response to rotation of the screw in one and an opposite direction, and an actuator assembly telescopically received within said housing at its said opposite end portion and movable linearly relative thereto in one and an opposite direction for projection from said opposite end portion in varying degree, said actuator being operatively connected with and driven by said drive nut and comprising a plurality of similar elongated acutating rods circumaxially arranged about said lead screw within said housing and an actuating head connected with each of said rods at end portions thereof adjacent said opposite end portion of the housing.

4,500,806

THREE-PHASE FLAT COILS

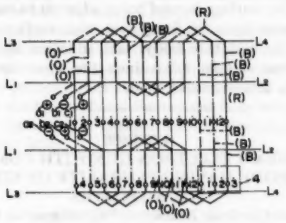
Kenji Kanayama, Kariya, and Hidekuni Sugi, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 4, 1983, Ser. No. 481,949

Claims priority, application Japan, Apr. 5, 1982, 57-57041

Int. Cl.³ H02K *3/00*

U.S. Cl. 310—198 **4 Claims**



1. A three-phase flat coil comprising:

a disc-like insulating plate having an opening at its center portion;

three-phase coil windings including a-phase, b-phase and c-phase windings, each wound in a wave form around said plate in the same direction, each of said windings including front and back portions extending on front and back sides, respectively, of said plate in a radial direction, selected front and back portions of said windings being connected by transition portions wrapped around inner and outer peripheries of said plate, the number of said transition portions being a multiple of three, each of said windings having a first half with a first end on said front side of said plate and a second end on said back side of said plate, and a second half with a first end on said front side of said plate and a second end on said back side of said plate;

a plurality of output terminals disposed on the outer periphery of said front side of said plate, each connected to one of said first ends, respectively, ends of said b-phase winding at said output terminals being different in polarity from the ends of a-phase and c-phase windings at said output terminals; and

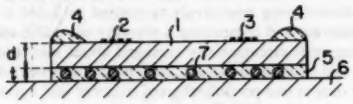
bridging wiring means positioned at substantially one point on the outer periphery of said back side of said insulating plate for three-dimensionally interconnecting said second ends of each said a-phase, b-phase and c-phase coil winding, respectively.

4,500,807

SURFACE ACOUSTIC WAVE TRANSMISSION DEVICE FOR A LOW FREQUENCY SIGNAL BELOW 30 MHZ

Akitsuna Yuhara; Norio Hosaka; Yuji Fujita; Kiyoharu Kishimoto, and Jun Yamada, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 3, 1983, Ser. No. 455,280
Claims priority, application Japan, Jan. 11, 1982, 57-1826
Int. Cl.³ H03H 9/25
U.S. Cl. 310—313 B 31 Claims



1. A surface acoustic wave transmission device comprising:

a piezoelectric substrate having two opposing main surfaces and provided on one of the surfaces an input transducer for transforming an electrical signal into a surface acoustic wave signal and an output transducer for transforming said surface acoustic wave signal into an electrical signal, said substrate propagating said surface acoustic wave signal from said input transducer to said output transducer;

a base body for mounting said piezoelectric substrate with the other surface thereof being adjacent to said body; and

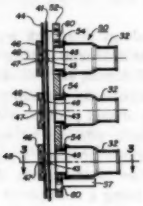
an adhesion layer for fixing said other surface of said substrate to said base body, said adhesion layer having a thickness at least 1/2.6 times the wave length of said surface acoustic wave signal.

4,500,808

MULTIBEAM ELECTRON GUN WITH COMPOSITE ELECTRODE HAVING PLURALITY OF SEPARATE METAL PLATES

Harry E. McCandless, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,688
Int. Cl.³ H01J 29/46, 29/50
U.S. Cl. 313—409 4 Claims



1. In a multi-beam electrode gun comprising at least two spaced successive electrodes individually held in position from a common support, one of said electrodes comprising a single metal first plate having at least three electron-beam-defining first apertures therein,

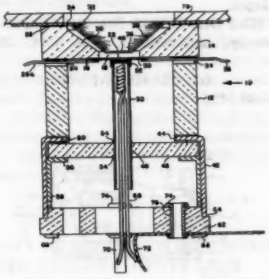
the improvement wherein said other electrode is a composite structure comprising (a) a single metal second plate having a window therein opposite each of said first apertures and (b) a plurality of separate metal third plates attached to said metal second plate, with one of said plurality of third plates closing each of said windows, each of said third plates having a single beam-defining second aperture therein separately aligned to one of said beam-defining first apertures.

4,500,809

ELECTRON GUN HAVING A LOW CAPACITANCE CATHODE AND GRID ASSEMBLY

Conrad J. Odenthal, Portland, and Dennis D. Askew, Gresham, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 273,829, Jun. 15, 1981, abandoned, which is a continuation of Ser. No. 28,473, Apr. 9, 1979, abandoned. This application Sep. 13, 1982, Ser. No. 417,298
Int. Cl.³ H01J 29/48
U.S. Cl. 313—444 5 Claims



1. An electrode assembly for an electron discharge device, comprising:

an annular dielectric support member having a front face, a rear face, and a central passage formed by a frusto-conical major interior surface extending between a circular front opening adjacent said front face and a substantially smaller circular rear opening adjacent said rear face,

a first, disk-shaped grid electrode, of a size not substantially exceeding that of said smaller opening, disposed overlying the smaller opening and bonded at its periphery to the support member's rear face,

a second nonplanar grid electrode bonded to the support member's front face, said second electrode including a recessed portion extending into said front opening to position a central region of the second electrode in closely-spaced relation to said first grid electrode, said recessed portion having a frusto-conical surface disposed in axially-aligned, closely-spaced relation to said frust-conical interior surface of the support member,

a cathode electrode having an activated, electron-emissive surface, and

means, including a dielectric member bonded to the rear surface of said annular support member, mounting said cathode electrode with its electron-emissive surface closely adjacent said first grid electrode,

said first and second grid electrodes each including a central aperture, the apertures of said electrodes and the electron-emissive surface of said cathode being arranged in mutual alignment.

4,500,810

FLUORESCENT LAMP HAVING INTEGRAL LIGHT-FILTERING MEANS AND STARTING AID

Eugene A. Graff, Cedar Grove, N.J., assignor to North American Philips Lighting Corporation, New York, N.Y.

Continuation of Ser. No. 210,428, Nov. 25, 1980, abandoned. This application Jul. 13, 1983, Ser. No. 513,258
Int. Cl.³ H01J 1/62
U.S. Cl. 313—486 10 Claims

1. A low-pressure fluorescent lamp having a visible selected color light output, comprising

an elongated outer sealed light-transmitting envelope,

a respective electrode adjacent each end of said envelope,

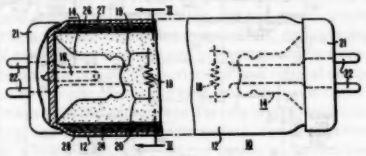
an electric discharge-sustaining ionizable medium contained within said envelope, and

at least outermost, next, and innermost separate layers of material arranged on the inner elongated surface of said envelope,

said outermost layer being electrically conductive and having a thickness selected such that the outermost layer is substantially transparent to visible light, and having a thickness and layer composition selected to function as a starting aid for the lamp,

said next layer being substantially non-conductive electrically and having a composition and thickness selected to transmit visible light rays of said selected color and to absorb visible light rays of at least another color, and

said innermost layer being substantially non-conductive electrically and having a composition and thickness selected such that, when irradiated by an electric discharge sustained in said medium, said innermost layer emits visible light radiations outwardly, said visible light radiations comprising primarily said selected color and said at least another color.



4,500,811

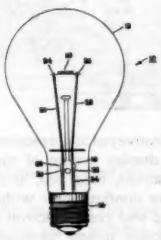
ELECTRIC LAMP WITH EXTERNAL FUSE LEAD

John E. McMillan, Kirtland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,786

Int. Cl.³ H01J *7/44, 17/34;* **H01H** *85/04*

U.S. Cl. 315—58 **9 Claims**



1. An electric lamp having a transparent envelope with a stem press seal region at one end which contains a resistive incandescent filament physically connected to a pair of conductive inlead wires of dispersion-strengthened copper alloy serving as the sole means of physical support for said resistive incandescent filament, said inlead wires extending through said stem press seal, and one of said inlead wires further being electrically connected to a fuse lead of a copper solution alloy with nickel and tin external of said stem press seal region.

4,500,812

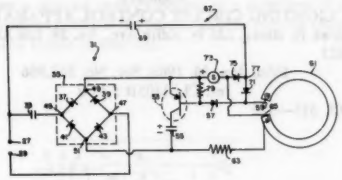
ELECTRONIC BALLAST CIRCUIT

William J. Roche, Merrimac, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 14, 1983, Ser. No. 466,247

Int. Cl.³ H05B *37/00*

U.S. Cl. 315—171 **13 Claims**



1. An electronic ballast circuit for a fluorescent lamp comprising:

a voltage divider network including a series-connected capacitor and rectifier means formed for connection to an AC voltage source;

starter circuit means including a capacitor coupled to a voltage source and to a first electrode of said fluorescent lamp and a glow starter means coupled to said rectifier means and to said first electrode of said fluorescent lamp;

ballast means coupled to said rectifier means and to a second electrode of said fluorescent lamp; and

auxiliary voltage means including a series connected switch and storage capacitor shunting said rectifier with a switch bias resistor coupled to the junction of said rectifier means and glow starter means and to the junction of said switch and first electrode of said fluorescent lamp whereby said storage capacitor is charged during operation of said fluorescent lamp.

4,500,813

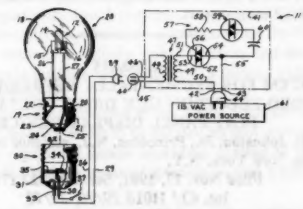
LIGHTING SYSTEM

Dennis L. Weedall, 695 W. Calumet Rd., River Hills, Wis. 53217

Filed Jul. 28, 1982, Ser. No. 402,785

Int. Cl.³ H05B *41/16*

U.S. Cl. 315—276 **6 Claims**



1. A lighting system for use with an electrical power source having a first predetermined power rating, comprising

a remote light assembly to be energized by a second predetermined power rating different than said first power rating and including a light bulb connected to an input circuit through a manually operable switch, and

an electronic control mechanism interconnecting said power source to said remote light assembly, said control mechanism including

a transformer having a first winding electrically connected to said manual switch for completing the lamp circuit and a second winding inductively coupled to said first winding and electrically connected to said power source through a gatable triac having a gate circuit operatively connected through capacitive means

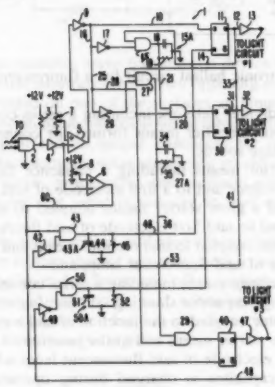
to said power source, closing of said remotely located manual switch changing the impedance of said transformer which changes the current phase and enables said gate circuit to gate said triac into conduction to conduct electrical energy from said power source to said transformer for energizing said bulb.

4,500,814

LIGHTING CIRCUIT CONTROL APPARATUS

Frederick H. Blake, 226 W. Edith Ave., No. 28, Los Altos, Calif. 94022

Filed Jun. 20, 1983, Ser. No. 505,986
Int. Cl.³ H05B *37/00*
U.S. Cl. 315—323 **11 Claims**



1. A light circuit control apparatus for turning on and turning off a plurality of lighting circuits in a first and a second predetermined sequence, respectively, comprising:

control means responsive to the intensity of ambient light in an area illuminated by said lighting circuits for turning on a succeeding one of said lighting circuits in said first predetermined sequence each time the intensity of the light in said area decreases to a first predetermined intensity and for turning off a succeeding one of said lighting circuits in said second predetermined sequence each time the intensity of the light in said area increases to a second predetermined intensity.

4,500,815

SYSTEM FOR SEGMENTALLY REFRESHING THE STORED ELECTRON GUN DRIVE VOLTAGES OF A FLAT PANEL DISPLAY DEVICE

Loren B. Johnston, Jr., Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

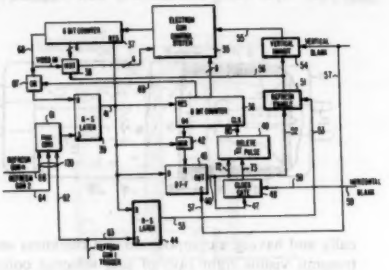
Filed Nov. 17, 1981, Ser. No. 322,171
Int. Cl.³ H01J *29/70, 29/72*
U.S. Cl. 315—366 **11 Claims**

1. In a brightness control system for controlling brightness uniformity on the display screen of a modular flat panel display device, said system including a digital memory for storing electron gun control voltages in accordance with the transfer characteristics of the electron guns within said display device, an incremental voltage counter for providing incremental voltages to said memory, a reference voltage counter for providing reference voltages to said system whereby selected ones of said incremental voltages are stored in said memory in accordance with said reference voltages; an improvement for sequentially refreshing stored voltages representative of segments of said transfer characteristic comprising:

clock gate means for applying clock pulses to said incremental voltage counter;

means for enabling and inhibiting said clock gate, said means for enabling and inhibiting being responsive to said incremental voltage counter whereby said clock gate is inhibited when said incremental voltage counter receives a predetermined number of clock pulses;

set/reset means for receiving gun refresh signals from said brightness control system and for enabling said counters and readying said means for enabling and inhibiting



whereby said clock gate is enabled in response to said set/reset means, and

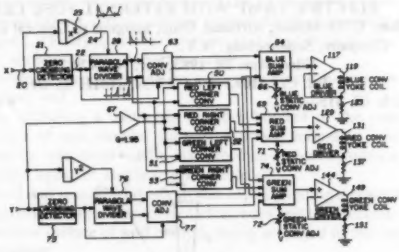
refresh enable means responsive to said set/reset means and to said means for enabling and inhibiting whereby said brightness control system is in a refresh mode when said clock gate is enabled and in a different mode when said clock gate is inhibited.

4,500,816

CONVERGENCE CONTROL APPARATUS FOR COLOR CATHODE RAY TUBE DISPLAY SYSTEMS

Charles J. Murphy, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,209
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—368 **9 Claims**



1. An improved conveyance correction apparatus for a color cathode ray tube display system of the shadow mask type having a display screen, blue, red, and green electron guns arranged in a delta configuration within the tube neck for producing blue, red and green electron beams and horizontal and vertical deflection means responsive to corresponding deflection signals for deflecting said beams horizontally and vertically across said display screen, each electron gun having convergence correction pole pieces for further deflecting each of said beams in accordance with convergence correction signals, said correction apparatus including signal responsive coil means coupled with each of said pole pieces for producing blue, red and green convergence correction magnetic fields, each of said coil means comprising an inductor with a generally C-shaped core responsive to combined horizontal and vertical components of said convergence correction magnetic fields; squaring means responsive to said horizontal and verti-

cal deflection signals, said signals comprising at least random stroke vector signals, for producing corresponding generally parabolic waveshape convergence correction signals, wherein said squaring means comprises means for producing signals proportional to the square of each of said horizontal and vertical deflection signals; wave splitter means also responsive to said horizontal and vertical deflection signals for splitting each of said parabolic waveshape signals into half parabolic waveshape signals corresponding to the left and right and top and bottom half sectors of said display screen respectively; means for separately adjusting the amplitudes of each half of each of said split parabolic waveform signals and for supplying left and right and top and bottom half blue, red and green convergence correction signals; means for respectively recombining each half of each of said blue, red and green convergence correction signals, and for combining horizontal and vertical components thereof to provide composite blue, red and green convergence correction signals; and means for supplying said composite convergence correction signals to said signal responsive coil means; wherein said wave splitter means is characterized by:

(a) horizontal and vertical zero crossing detection means for providing signals dependent upon whether said beams are deflected into said right and left top and bottom halves of said display screen, and

(b) switch means responsive to said horizontal and vertical squaring means and said zero crossing detector means for splitting said horizontal and vertical parabolic waveshape signals.

4,500,817

TAPE TENSION SENSOR AND SERVO EMBODYING SAME

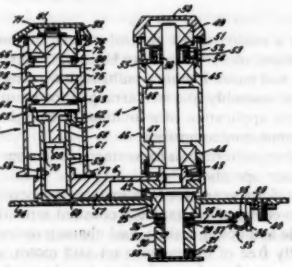
Stefan Kudelski, Le Mont-sur-Lausanne, Switzerland, assignor to Kudelski, S.A., Lusanne, Switzerland and Ampex Corporation, Redwood City, Calif.

Filed Sep. 15, 1983, Ser. No. 533,163

Claims priority, application United Kingdom, Sep. 17, 1982, 8226569

Int. Cl.³ B65H *59/38*

U.S. Cl. 318—7 **13 Claims**



1. A tape tension sensor for a magnetic tape transport apparatus, comprising:

a guide member for engaging the tape;

means mounting the guide member for movement in response to a change in the tension of the tape;

a core member which includes a gap;

a sensing coil disposed on the core member;

a plate member mounted for movement conjointly with the guide member, said plate member extending into said gap; and

at least one shaped strip of lossy material carried in the plate member, the said strip being capable of varying the quality factor of the coil as the guide member moves.

6. A tape loop sensor for a tape transport apparatus, the sensor comprising:

a guide member for engaging a loop of tape;

a pivoted arm carrying said guide member and capable of pivoted movement in response to changes of the length of said loop;

a sensing coil; and

carrier means mounted for movement with said arm in a position to extend adjacent said coil, the said carrier means including a shaped member, said shaped member comprises a tapered strip extending in a direction of relative movement between the carrier and the coil for varying the quality factor of said coil.

4,500,818

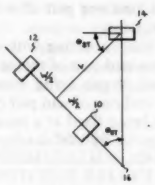
DUAL MOTOR PROPORTIONING CONTROL

Charles E. Konrad, Roanoke; Ronald E. Gareis, and Amratlal C. Lodhia, both of Charlottesville, all of Va., assignors to General Electric Company, Charlottesville, Va.

Filed Dec. 22, 1983, Ser. No. 564,176

Int. Cl.³ H02P *7/68*

U.S. Cl. 318—52 **6 Claims**



1. A control system for an electrically powered vehicle of the type having dual drive motors with series connected armature windings and separately excited field windings, said dual motors being arranged such that one motor thereof is provided for each of two driven wheels on a common axle line for which one wheel assumes a radially inside position and the other a radially outside position with respect to a turning radius of the vehicle, comprising:

means providing a tractive effort signal representative of a desired tractive effort to be exerted by said driven wheels;

armature regulating means providing current to said series connected armatures in proportion to said tractive effort signal;

field regulating means providing a first excitation signal according to which excitation of each field winding is regulated;

means providing a turning radius signal representative of a selected turning radius for said vehicle;

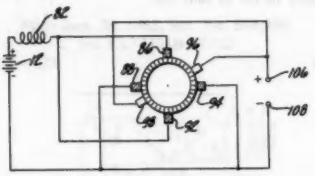
means responsive to said turning radius signal to provide an inside wheel signal and an outside wheel signal, said signals being related to each other such that an increase or decrease in one signal value results in a corresponding decrease or increase in the other, the sum of said values being a constant; and

means adjusting one corresponding field winding excitation in accordance with the outside wheel signal and the other field winding excitation in accordance with the inside wheel signal.

4,500,819
AUXILIARY ELECTRIC POWER SUPPLY FOR ELECTRIC WORK VEHICLES

George J. Trusock, Battle Creek; James J. Bauer, Richland, and Bhupen Gandhi, Battle Creek, all of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 9, 1983, Ser. No. 550,245
Int. Cl.³ H02K 47/16
U.S. Cl. 318—106 3 Claims



1. In an electrical system for a work vehicle of the type comprising an electric traction motor, a storage battery for energizing the traction motor, a hydraulic system including a pump and a DC motor for driving the pump,

said traction motor and said DC motor being connected with said battery for energization thereby, and an auxiliary electrical load circuit which requires a lower voltage than that of said battery, said DC motor having an armature winding, a commutator connected with the armature winding and at least one pair of motor brushes coacting with the commutator,

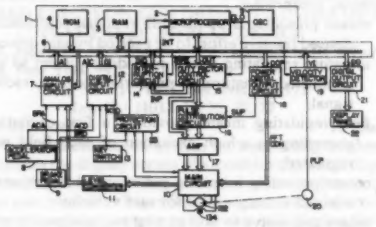
and an auxiliary brush coacting with said commutator at a location between said pair of motor brushes,

said auxiliary load circuit being connected between said auxiliary brush and one of said pair of motor brushes, said auxiliary brush being fixed at a location which produces the voltage required by said auxiliary load circuit.

4,500,820
PROTECTIVE CONTROL APPARATUS FOR ELECTRICAL VEHICLE

Yasuo Noto; Shotaro Naito, both of Katsuta, and Tsutomu Ohmae, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 4, 1981, Ser. No. 318,109
Claims priority, application Japan, Nov. 6, 1980, 55-155206
Int. Cl.³ H02P 5/06
U.S. Cl. 318—139 5 Claims

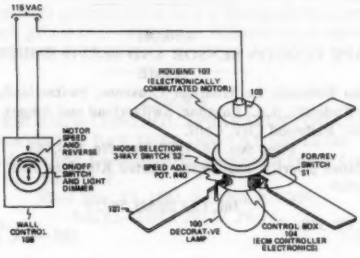


1. In a control apparatus for electric vehicles comprising a d-c power supply, a d-c motor to be selectively connected to said power supply, a chopper circuit which periodically applies the voltage of said power supply to said motor in response to the amount of actuation of the accelerator pedal, a current detector which detects the current that flows into said motor, a computer for controlling said chopper circuit based upon an instruction signal from said accelerator pedal and a detection current from said current detector, and an interrupt signal generator which generates an interrupt signal for starting said computer in synchronism with the control signal which controls said chopper circuit, the improvement comprising means for generating a predetermined signal, means for adding output signals from said signal generating means to the instruction signal of said accelerator pedal, means for comparing said added signal with a signal that corresponds to the output of said current detector, and means for resetting said computer to stop normal operation of said d-c motor when the signal corresponding to the output of said current detector is greater than said added signal and for initializing said computer a predetermined time after said resetting to start again the normal operation of said d-c motor after said predetermined period of time has passed.

4,500,821
SPEED OR TORQUE CONTROL CIRCUIT FOR AN ELECTRONICALLY COMMUTATED MOTOR (ECM) AND METHOD OF CONTROLLING THE TORQUE OR SPEED OF AN ECM

Ricky F. Bitting, Raleigh, N.C., and William Peil, North Syracuse, N.Y., assignors to General Electric Company, Fort Wayne, Ind.

Filed Jun. 9, 1983, Ser. No. 502,599
Int. Cl.³ H02P 6/02
U.S. Cl. 318—254 26 Claims



1. In a motor speed control circuit for an electronically commutated motor adapted to be energized from a DC power source, said motor having a multistage winding assembly and a magnetic assembly, the two arranged for mututl relative rotation upon application of a multi-stage energization sequence, the combination comprising:

power input terminals for connection to a supply suitable for motor operation;

a waveform generator for supplying a repetitive low voltage waveform of substantially constant repetition rate, amplitude and configuration, said characteristics being substantially free of dependence on said motor, said waveform having a first slope of a first duration and a second slope of a second duration and of opposite sense to said first slope, and a repetition rate which is high in relation to the commutation rate:

means for producing a substantially smooth adjustable control voltage;

a modulating comparator having a first input to which said repetitive voltage waveform is supplied and a second input to which said adjustable control voltage is supplied, to produce output pulses when intersections occur between said inputs, said output pulses having an "active" on time equal to the interval between alternate pairs of intersections and occurring at said constant repetition rate; and

control logic means responsive to the "active" on time of said modulator pulses for providing pulse width modulated signals for control of the energization of the winding states in said multistate energization sequence

whereby adjustment of said control voltage, adjusts the

active on time of each pulse and thereby the rate at which electrical energy is supplied to the motor for determination of the motor speed or torque.

4,500,822

DIGITAL CAPSTAN SERVO CIRCUIT

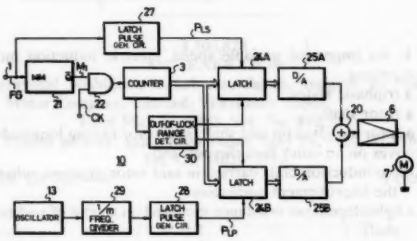
Shigeru Tajima; Hiroshi Okada, and Kenji Nakano, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1983, Ser. No. 534,508

Claims priority, application Japan, Sep. 28, 1982, 57-146850[U]; Sep. 30, 1982, 57-148915[U]

Int. Cl.³ G05B *5/00*

U.S. Cl. 318—314 **6 Claims**



1. A digital servo circuit for controlling the rotational speed and phase of a rotating motor in a magnetic recording/reproducing apparatus to a desired speed and desired phase relative to a fixed phase by supplying a control signal to said motor, said digital servo circuit comprising:

a source of FG pulse signals generated in synchronism with the rotation of said motor;

means for generating a periodic pulse signal in response to each FG pulse signal, respectively, having the same period as said respective FG pulse signal and divided into first and second durations;

a source of clock pulses having a predetermined frequency;

means for cyclically counting said clock pulses during said second duration and producing a counted output in response thereto, said counted output being reset to zero after a cyclic period in which a maximum counted number of clock pulses have been counted;

said frequency of said clock pulses and said maximum counted number being preselected such that, when said motor rotates at said preselected speed, the number of clock pulses occurring during said second duration exceeds said maximum counted number, whereby said second duration is divided into at least one complete cyclic period and a final incomplete period;

first latch pulse generating means for producing a first latch pulse in response to said FG pulse signals during said first duration at a first timing position when said counted output is proportional to the rotational speed of the motor;

first latch means for latching said counted output in response to said first latch pulse to produce a first counted value;

second latch pulse generating means for producing a second latch pulse during said second duration at a second timing position when said counted output corresponds to the phase of said motor;

second latch means for latching said counted output in response to said second latch pulse to produce a second counted value;

means for generating said control signal in response to said first and second latched counted values, and

means for supplying said control signal to said motor for controlling the phase and speed of said motor.

4,500,823

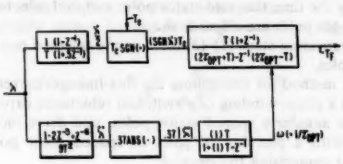
ELECTRO-OPTICAL TRACKING SYSTEM WITH ADAPTIVE BEARING FRICTION COMPENSATION

Craig D. Walrath, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 25, 1983, Ser. No. 469,876

Int. Cl.³ G05D *23/275*

U.S. Cl. 318—632 **6 Claims**



1. A system for adaptively compensating for gimbal bearing friction in an electro-optical system in which an optical sensor is aimed and maintained directed along a desired line-of-sight, with the optical sensor mounted on a gimbal having at least one axis of rotation relative to a gimbal bearing axis for aiming the sensor along the line-of-sight, which electro-optical system includes synchro means for sensing angular motion of the gimbal axis relative to a stable base frame of reference with feedback means coupled to a gimbal rotational drive means for stabilizing the angular motion of the gimbal axis, and wherein compensation signal means generates a real-time adaptive compensation signal which is predictive of gimbal bearing friction torque, which compensation signal is added to the gimbal rotational drive signal to negate bearing friction by producing a component of rotational torque which is equal and opposite to the torque from bearing friction.

4,500,824

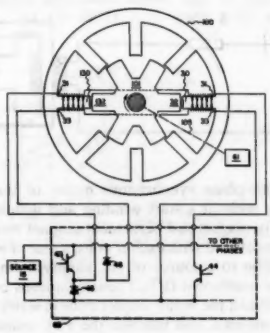
METHOD OF COMMUTATION AND CONVERTER CIRCUIT FOR SWITCHED RELUCTANCE MOTORS

Timothy J. E. Miller, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 21, 1984, Ser. No. 612,517

Int. Cl.³ H02K *29/02*

U.S. Cl. 318—701 **10 Claims**



1. A method for controlling the flux-linkage/current trajectory in a phase winding of a switched reluctance drive wound on two angularly-spaced stator poles, said drive including a rotor with a plurality of pairs of spaced rotor poles, each pair of rotor poles having the same angular spacing as said stator poles, said method comprising the steps of:

(1) increasing the current in said phase winding to a predetermined value in order to build up flux in said stator poles

while said stator poles and a selected pair of rotor poles are unopposed but within a predetermined distance;

(2) short-circuiting said phase winding from approximately the time that said stator poles and said selected pair of rotor poles are first overlapped until they are nearly aligned, to provide a period of substantially constant flux linkage and decreasing phase winding current;

(3) decreasing said current in said phase winding by free-wheeling to decrease said flux linkage substantially to zero by the time that said stator poles and said selected pair of rotor poles are aligned; and

(4) repeating steps (1)–(3) for a newly selected pair of rotor poles.

5. A method for controlling the flux-linkage/current trajectory in a phase winding of a switched reluctance drive wound on two angularly spaced stator poles, said drive including a rotor with a plurality of pairs of spaced rotor poles, said method comprising the steps of:

(1) increasing the current in said phase winding to a predetermined value in order to build up flux in said stator poles while said stator poles and a selected pair of rotor poles are unopposed but within a predetermined distance;

(2) removing the current from said phase winding through a nonlinear device across said phase winding to provide substantially constant voltage across said winding, beginning said removal at approximately the time that said stator poles and said selected pair of rotor poles are first overlapped, said non-linear device causing said flux to decrease substantially to zero by the time that said poles are aligned; and

(3) repeating steps (1)–(2) for a newly selected pair of rotor poles.

4,500,825

SELF-STARTING SINGLE-PHASE SYNCHRONOUS MOTOR

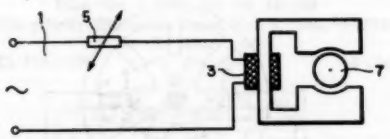
Hugo Schemmann, Schaesberg, Netherlands, and Leo Bertram, Stolberg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1982, Ser. No. 408,583

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3202965

Int. Cl.³ H02P *1/42*

U.S. Cl. 318—792 **10 Claims**



1. A single-phase synchronous motor of the type that is self-starting without a start winding and which comprises: a diametrically magnetized permanent magnet rotor and a two-pole stator provided with exciter coils, a pair of input terminals for connection to a source of AC supply voltage, a positive temperature coefficient (PTC) resistor, means connecting the PTC resistor and the motor exciter coils in series circuit across the input terminals, and wherein the PTC resistor is proportioned so that at start-up of the motor the PTC resistor has a relatively low resistance value such that a start-up current is applied to the exciter coils of a value larger than the permissible current flow during normal motor operation and sufficient to accelerate the motor to its normal running speed within approximately 0.5 to 1 second after said AC voltage is applied to the input terminals and the resistance of the PTC resistor will increase to a continuously permissible load resistance value within said approximately 0.5 to 1 sec.

4,500,826

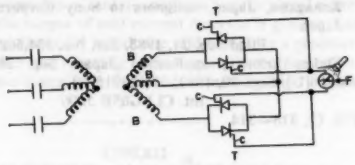
VARIABLE SPEED ELECTRIC INDUCTION MOTORS WITHOUT BRUSHES

Fausto L. Espinosa, and Cesar L. Nunez, both of Braque 4284, Miravalle, Gaudalajara, Jalisco, Mexico

Filed Jun. 14, 1983, Ser. No. 504,373

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—820 **2 Claims**



1. An improved variable speed, electric induction motor comprising

a triphasic stator;

a rotor shaft;

a rotor mounted on said shaft, said rotor having longitudinal grooves on an outer face thereof; and

three induction coils carried in said rotor grooves; wherein the improvement comprises

a light-dependent resistance mounted on an end of said rotor shaft;

four controlled diodes mounted in two pairs on said rotor, each of said diodes having a control electrode and each pair of said diodes being electrically connected to one of said induction coils;

said light-dependent resistance being electrically connected to said control electrodes whereby current flowing to said control electrodes is dependent on the light incident on said light-dependent resistance.

4,500,827

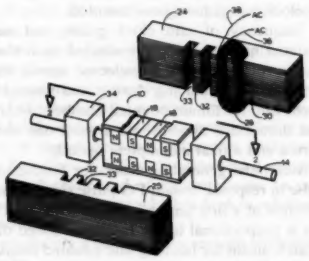
LINEAR RECIPROCATING ELECTRICAL GENERATOR

Thomas D. Merritt, and Mario J. Pasichinskyj, both of 9025 Hawthorne St., Surfside, Fla. 33154

Filed Jun. 11, 1984, Ser. No. 619,080

Int. Cl.³ H02K *35/00*

U.S. Cl. 322—3 **5 Claims**



1. An electric generator, comprising:

(a) a linear reciprocating armature mechanically coupled to a source of relative motion, said armature comprising a plurality of magnet means defining north-south poles in alternately opposite pole direction, the axis of said poles being orthogonal to the direction of reciprocation of said armature, each of said pole magnet means mounted parallel to each other at relative distances equal to their widths in the direction of armature reciprocation;

(b) a stator comprising a plurality of groups of continuous windings, each winding group corresponding to a physi-

cally adjacent pair of magnet means, each winding group wound parallel to a plane defined by the direction of reciprocation of said armature and a center point of the axis of the poles of said magnet means, each winding having a width equal to the width of each magnetic pole in the direction of armature reciprocation, and each side of each winding group separated from the next winding group by a space equal to the width of a pole of each magnet means in the direction of armature reciprocation;

(c) means for limiting the advance and reverse of the armature to three times the width of the pole of each magnet means in the direction of armature reciprocation;

(d) means for taping the induced current in each coil group and for providing such current to a load; and

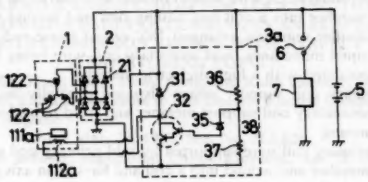
(e) housing means for positioning the stator magnetically adjacent to the armature to minimize the air gap between the poles and the windings.

4,500,828

AC GENERATOR

Teruyoshi Nishihara, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 11, 1983, Ser. No. 493,763
Claims priority, application Japan, May 24, 1982, 57-87615
Int. Cl.³ H02P 9/14
U.S. Cl. 322—46 **6 Claims**



1. An AC generator comprising:

a stator coil;

a pole core, comprising a permanent magnet for creating a magnetic field which produces an output voltage in the stator coil;

a reverse field coil disposed to reduce the magnetic field when a field current flows therethrough; and

a voltage regulator responsively connected to the stator coil and connected to the reverse field coil, the voltage regulator having means in series with the reverse field coil for permitting the field current flow through the reverse field coil only when the output voltage is above a predetermined value.

4,500,829

ADVANCE AND RETARD PHASE-SHIFT TRANSFORMER

Theodore R. Specht, Sharon, Pa., and Edward J. Cham, Howland, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 3, 1983, Ser. No. 538,391
Int. Cl.³ H02J 3/00; G05F 3/00
U.S. Cl. 323—215 **9 Claims**

1. A phase-shift transformer circuit adapted for connection to a three-phase power system for providing a phase-shifted ac signal at a predetermined advance or retard phase shift angle, said phase-shift transformer circuit comprising:

a magnetic core;

electrical winding means disposed in inductive relation with said magnetic core, for establishing a magnetic flux therein;

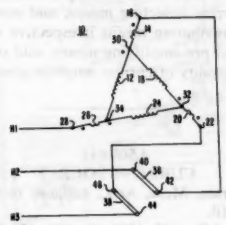
said electrical winding means including a primary winding, having first, second, and third input terminals connected to first, second, and third phase coils respectively, and including a secondary winding having a plurality of output terminals;

each of said first, said second, and said third phase coils of said primary winding including first and second portions;

each of said first and said second portions of said first, and second, and said third phase coils having a predetermined number of turns and wound on said magnetic core to obtain the predetermined phase shift angle;

said first input terminal being adapted for connection to a first selected phase of the power system;

switchable means having first and second configurations,



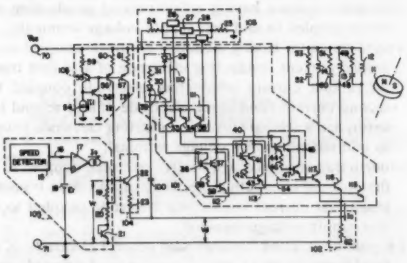
wherein in said first configuration said second input terminal is adapted for connection to a second selected phase of the power system and said third input terminal is adapted for connection to a third selected phase of the power system to provide an advance phase-shifted ac signal at said plurality of output terminals, and wherein in said second configuration said second input terminal is adapted for connection to the third selected phase of the power system and said third input terminal is adapted for connection to the second selected phase of the power system to provide a retard phase-shifted ac signal at said plurality of output terminals.

4,500,830

CURRENT CONTROL CIRCUIT FOR A PLURALITY OF LOADS

Makoto Gotou, Nishinomiya, and Hiroshi Okamoto, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 17, 1982, Ser. No. 408,771
Claims priority, application Japan, Aug. 18, 1981, 56-130025
Int. Cl.³ H02P 5/16; G05F 1/56
U.S. Cl. 323—267 **4 Claims**



1. An electronic control circuit for distributing a load current to a plurality of loads and controlling the load current correspondingly to a reference signal in a wide range, comprising:

a current detecting means for detecting a magnitude of the load current flowing through said plurality of loads;

a reference signal generating means for generating said reference signal which varies continuously with time;

a comparator means for providing a current signal in core-

spondence with the difference between an output signal of said current detecting means and said reference signal;

a distributing means having pre-amplifying means for amplifying the current signal provided by said comparator means, a switching means for distributing an output current of said pre-amplifying means, and a plurality of current amplifying means for respectively amplifying and supplying distributed currents from said switching means to said plurality of loads; and

a capacitor coupled between an output terminal of said current detecting means and an output terminal of said comparator means for stabilizing a feedback loop formed by said current detecting means, said comparator means and said distributing means irrespective of variations in gains of said pre-amplifying means, said switching means and said plurality of current amplifying means.

4,500,831

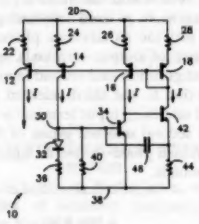
CURRENT SOURCE

M. Faheem Akram, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1982, Ser. No. 453,329

Int. Cl.³ G05F *3/08*

U.S. Cl. 323—315 **1 Claim**



1. A current source circuit having a first supply voltage terminal and a second supply voltage terminal, comprising:

biasing means for establishing a bias voltage comprising a first transistor having a first current conducting electrode coupled to said first supply voltage terminal, a first resistor coupled to said second supply voltage terminal, and a diode coupled between said first resistor and a second current conducting electrode of said first transistor;

a second transistor having a first current conducting electrode coupled to said first supply voltage terminal;

a third transistor having a control electrode coupled to said second current conducting electrode of said first transistor, a first current conducting electrode coupled to a second current conducting electrode of said second transistor, and a second current conducting electrode coupled to said second supply voltage terminal;

a fourth transistor having a control electrode coupled to said first current conducting electrode of said third transistor, and a first current conducting electrode coupled to said first supply voltage terminal;

a capacitor coupled between said control electrode of said third transistor and a second current conducting electrode of said fourth transistor;

resistive means coupled between said second current conducting electrode of said fourth transistor and said second supply voltage terminal; and

a fifth transistor having a first current conducting electrode coupled to said first supply voltage terminal, a control electrode coupled to a control electrode of both said first and said second transistor, and a second current conducting electrode supplying an output current.

4,500,832

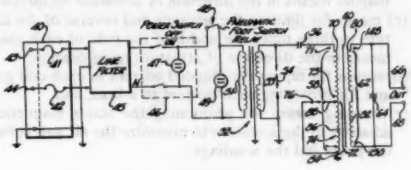
ELECTRICAL TRANSFORMER

Stanley Mickiewicz, Stoughton, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Feb. 28, 1983, Ser. No. 470,641

Int. Cl.³ G05F *1/14*

U.S. Cl. 323—340 **10 Claims**



1. A transformer comprising

an annular secondary coil support member;

support means for supporting said secondary coil support member and for permitting said secondary coil support member to move along its axis with respect to said support means;

means for locking said secondary coil support member in a specific axial location with respect to said support means;

a secondary coil wire wound on said secondary coil support member into a coil and having first and second voltage divider segments arranged 180° out of phase and having equal inductance, said secondary coil wire being heavily insulated with a high dielectric material;

primary coil support means disposed coaxially with said secondary coil support member and fixed to said support means;

a primary coil wire supported by said primary coil support member and wound into a coil and having an axis coaxial with the axis of said secondary coil;

said primary coil including first and second voltage divided segments arranged in phase and having equal inductance;

a plurality of taps for said second segment of said primary coil;

a multi-position switch having a plurality of contacts each of which is connected to a separate one of said plurality of taps in series for selectively grounding a selected one of said taps to vary the effective length of said second segment of said primary coil.

4,500,833

SWITCHED MODE POWER SUPPLY TRANSFORMER

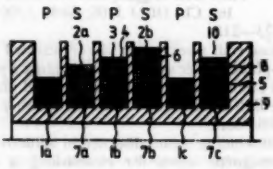
Gerhard Napp, Hemmingen; Ulrich Bieringer, Hanover; Heinz Kreismer, Hanover, and Walter Goseberg, Hanover, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 26, 1982, Ser. No. 402,041

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1981, 3129381

Int. Cl.³ H01F *27/28*

U.S. Cl. 323—359 **15 Claims**



1. A switched mode power supply transformer, particularly for a television receiver, comprising in combination:

a primary winding and a secondary winding, with said pri-

mary winding being subdivided into three partial windings and said secondary winding being subdivided into two partial windings;

a chamber coil body having a plurality of chambers;

said partial windings of said primary winding being disposed only in a first group of said chambers, and said partial windings of said secondary winding being disposed only in a second group of said chambers, with each of said partial windings being disposed in a respective one of said chambers;

said chambers of said first group being interleaved with said chambers of said second group such that they alternate in sequence with said primary partial windings and said secondary partial windings being alternatingly disposed in five successive said chambers, so as to generate the major operating voltage at said secondary winding;

an additional secondary winding for generating a further operating voltage, said additional secondary winding likewise being subdivided into a plurality of partial windings; and,

said partial windings of said additional secondary winding are disposed only in respective said chambers of said second group below any of said partial windings of said secondary winding.

4,500,834

APPARATUS AND METHOD FOR LOCATING THE POSITION OF A FAULT OCCURRING IN AN ELECTRIC POWER TRANSMISSION SYSTEM WITH RESPECT TO A MONITORING POINT

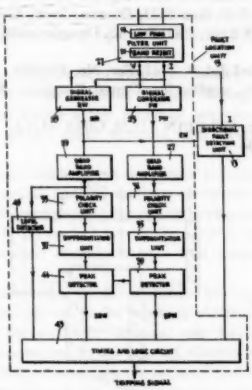
Yu M. Ko, Hung Hom, Hong Kong, and Keith Cornick, Manchester, England, assignors to The General Electric Company, p.l.c., England

Filed Mar. 29, 1982, Ser. No. 362,625

Claims priority, application United Kingdom, Apr. 3, 1981, 8110508

Int. Cl.³ G01R *31/08*; H04B *3/46*

U.S. Cl. 324—52 **18 Claims**



1. A method of locating the position of a fault occurring in an electric power transmission system with respect to a monitoring point comprising: determining the time taken for a transient component of a fault signal to travel from said monitoring point to the fault and back to said monitoring point after reflection at the fault; and comparing said time taken with the time that a transient signal would take to travel from said monitoring point to the end of a zone of the system to be protected by a protective relay equipment associated with the system and back to the monitoring point, thereby to determine whether the fault lies within said zone.

4,500,835

METHOD AND APPARATUS FOR DETECTING GRAIN DIRECTION IN WOOD, PARTICULARLY IN LUMBER

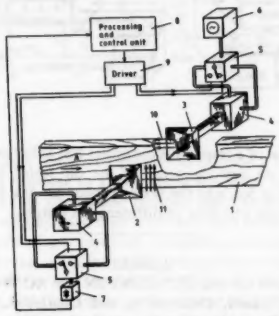
Sakari Heikkila, Espoo, Finland, assignor to A. Ahlstrom Osakeyhtio, Karhula, Finland

Continuation-in-part of Ser. No. 042,517, May 25, 1979, abandoned. This application Jun. 1, 1982, Ser. No. 383,588

Claims priority, application Finland, Jun. 1, 1978, 781738

Int. Cl.³ G01R *27/04*

U.S. Cl. 324—58.5 R **15 Claims**



1. A method for detecting grain direction in wood, particularly in lumber, by means of high frequency microwave radiation energy which is impinged onto the piece of wood to be measured, comprising the steps of:

transmitting radiation energy by means of at least one transmitting antenna and by employing two mutually orthogonal directions of polarization;

transmitting said radiation energy by said transmitting antenna with two mutually orthogonal directions of polarization whereby the dielectric anisotropy of the wood through which the radiation energy is transmitted induces a change in the direction of the polarization; and

receiving the radiation energy impinged onto the wood by means of at least one receiving antenna and by employing two mutually orthogonal directions of polarization among which directions at least one is as such characteristically perpendicular to any one direction of the polarization of the transmitting field;

obtaining two signals by detecting the microwave power collected by the receiving antenna with each polarization direction after impinging on said wood; and

calculating a measure of grain direction from said two signals.

4,500,836

AUTOMATIC WAFER PROBER WITH PROGRAMMABLE TESTER INTERFACE

George E. Staudacher, Los Gatos, Calif., assignor to Pacific Western Systems, Inc., Mountain View, Calif.

Filed Oct. 31, 1980, Ser. No. 202,499

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—73 AT **4 Claims**

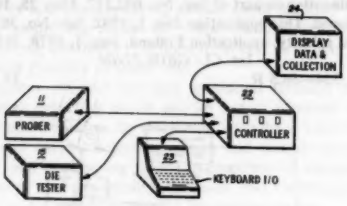
1. In a method for interfacing an automatic wafer prober with any one of a number of different die testers for probing and testing circuit die on a semiconductor wafer and for correlating the results of the test with respective tested die on the wafer, the steps of;

storing in memory associated with the wafer prober a plurality of sets of data there being one set of data for each of a plurality of different die testers, each set of data defining the sense of a plurality of test result output signals derived from the particular die tester to be interfaced to the prober after test of the respective die under test;

selecting the particular set of stored data corresponding to

the particular die tester to be interfaced to the wafer prober; and

employing the selected set of data for modifying the sense of the test result output signals derived from the die tester



after test of a respective die under test as fed into the wafer prober so that the sense of the die tester result output signals as fed into the wafer prober are the same for any one of the plurality of different die testers.

4,500,837

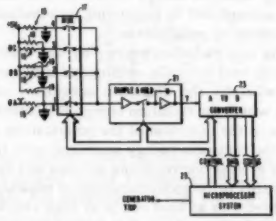
DETECTION OF DC CONTENT IN AN AC WAVEFORM

Kenneth C. Shuey, Cridersville, and Charles L. Doughman, Shawnee Township, Allen County, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1981, Ser. No. 225,226

Int. Cl.³ G01R *19/00;* **H04B** *15/00;* **H02P** *13/20*

U.S. Cl. 324—102 **8 Claims**



1. A method for determining the DC content of a plural phase periodically time varying waveform including:

successively measuring the instantaneous value of each phase of the waveform at a first point in each phase,

storing signals representative of said first instantaneous value of each phase of the waveform,

successively measuring the instantaneous value of each phase of said plural phase waveform at respective second points each spaced substantially an exact odd number of half-cycles of said waveform from the respective first point, wherein said instantaneous values of each phase of said waveform at said first and second points are equally and oppositely displaced from the midvalue of the associated phase of said waveform,

storing signals representative of the instantaneous value of each phase of the waveform at each of said respective second points,

generating a signal equal to the DC content of each phase by averaging the signals representative of the instantaneous value of the associated phase of the waveform at said associated first and second points,

selecting the largest one of said DC content signals,

comparing said largest one of said DC content signals with a preselected threshold signal level, and

generating an output signal if said largest one of said DC content signals exceeds said threshold signal level.

4,500,838

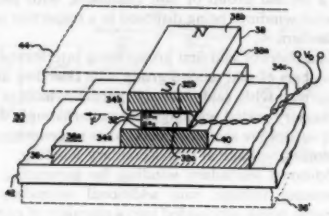
CURRENT SENSOR

Milton D. Bloomer, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,427

Int. Cl.³ G01R *33/00*

U.S. Cl. 324—117 R **12 Claims**



1. A sensor having an output responsive to the first power of a sensed current, comprising:

a piezoelectric element having first and second opposed surfaces;

first and second electrodes fabricated upon said piezoelectric element first and second surfaces, said sensor output being provided between said first and second electrodes;

conductor means positioned adjacent to one piezoelectric element surface for carrying a current to be measured therepast; and

a permanent magnet member positioned adjacent to the remaining surface of the piezoelectric element and having the north-south poles thereof aligned normal to the direction of current flow in said conductor means.

4,500,839

METHOD AND APPARATUS FOR MONITORING WEAR PARTICLES IN A LIQUID MEDIUM

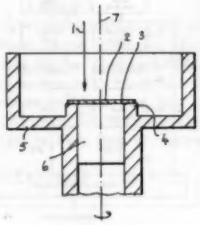
David G. Jones, P.O. Box 9531, Dharan, Saudi Arabia, and Oh K. Kwon, KIST Labs, P.O. Box 13, Dongdaemum, Seoul, Rep. of Korea

Filed Jul. 9, 1982, Ser. No. 396,689

Claims priority, application United Kingdom, Jul. 9, 1981, 8121183

Int. Cl.³ G01N *27/74;* **G01R** *33/12*

U.S. Cl. 324—204 **15 Claims**



1. A method of monitoring one of magnetically polarized, magnetically polarizable, electrically polarized and electrically polarizable particles carried in a liquid medium and comprising the steps of:

impinging a flow of the liquid medium onto an upper surface of a substrate located in a magnetic or electric force field respectively, having a component extending substantially at right angles to the surface for attracting the particles thereonto;

rotating the substrate about an axis which passes through the substrate and is disposed substantially parallel to the force

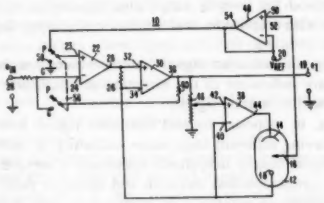
field, the force field remaining fixed with respect to the substrate during said rotation instead of having relative motion between the two during the rotation of said rotating substrate, and said rotation being at an angular speed sufficient to modify the flow of the medium across the surface and permit the force field to precipitate the particles onto the surface; and monitoring optically the precipitated particles.

4,500,840

HIGH SPEED, POWER POTENTIOSTAT/GALVANOSTAT WITH IR COMPENSATION FOR USE WITH AN ELECTROCHEMICAL CELL

Ronald K. Galwey, Los Gatos, and Kay K. Kanazawa, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1982, Ser. No. 437,412
Int. Cl.[3] G01N *27/42*
U.S. Cl. 324—425 **6 Claims**



1. An electronic circuit for analyzing the operation of electrochemical cells of the type having a counter electrode, a reference electrode, and a working electrode in terms of potential and current modes of operation selectively, said circuit comprising

first and second instrument output terminals;

an input differential amplifier circuit having a first input terminal to which a test potential waveform is applied having a second input terminal, and having an output terminal;

a resistor connected between the output terminal of the input amplifier circuit and the working electrode of the cell;

an output differential amplifier circuit having input terminals individually connected across the resistor and having an output terminal connected to a first instrument output terminal;

a control differential amplifier circuit having a first input terminal connected to the working electrode of the cell, having a second input terminal and having an output terminal connected to the counter electrode of the cell;

electric circuitry connecting the second input terminal of the control amplifier to the first instrument output terminal; a reference differential amplifier circuit having a first input terminal to the reference electrode of the cell, having a second input terminal connected to the second instrument output terminal and having an output terminal connected to the second input terminal of the input differential amplifier circuit; and

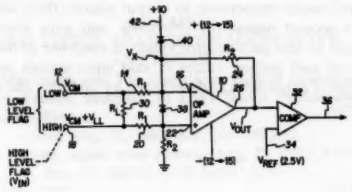
a double-pole, double-throw switch means for selectively connecting the second input terminal of the input amplifier circuit to the output terminal of the reference amplifier circuit or to ground and in the latter case for connecting the first input terminal through a resistor to the first instrument output terminal.

4,500,841

UNIVERSAL INSTRUMENT FLAG RECEIVER

William A. Morey, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 13, 1982, Ser. No. 417,007
Int. Cl.[3] H03K *5/153*
U.S. Cl. 328—146 **4 Claims**



1. A flag receiver circuitry operable to provide a flag activating output in response to a differential low-level flag input being applied to first and second receiver input terminals and in response to a single-ended high level flag input being applied to said first receiver input terminal; comprising an operational amplifier connected in differential configuration with common-mode input rejection capability, a flag load resistor connected between said first and second receiver input terminals, said first and second receiver input terminals connected through like-valued input resistors to the respective noninverting and inverting inputs of said operational amplifier, said operational amplifier, in response to said low-level flag input being applied to said first and second receiver input terminals, developing a trip point definitive output in response to a predetermined low-level flag input level;

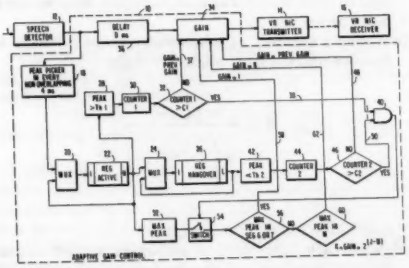
means for clamping the voltage level on the inverting input to said operational amplifier, said operational amplifier being responsive to said high level flag input being applied to said first receiver input terminal to develop said trip point definitive output, said clamping being effected at a level in excess of the level on said inverting input when said low-level flag input is applied to said first and second receiver input terminals.

4,500,842

ADAPTIVE GAIN VARIABLE BIT RATE NIC PROCESSOR

Krishnamoorthy Virupaksha, Brookeville, and Henri G. Suyderhoud, Potomac, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Mar. 30, 1982, Ser. No. 363,699
Int. Cl.[3] H03K *17/00, 5/00;* G06G *7/14*
U.S. Cl. 328—150 **9 Claims**



1. A signal processing apparatus comprising:

gain control means for receiving input signals and providing said input signals as gain-adjusted output signals, the gain

of said gain control means being adjusted in response to a gain adjustment signal;

first means for determining the highest value of samples of said input signals during each of several first time periods:

second means for determining the highest value of samples of said input signals during each of several time periods which precede said first time periods; and

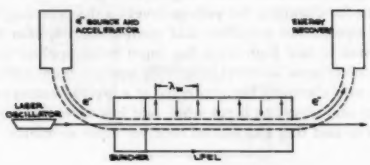
control means responsive to output signals from said first and second means for providing said gain adjustment signal to said gain control means in response to the number of said highest values of said input signals within a range of amplitudes as determined by said first and second means.

4,500,843

MULTIFREQUENCY, SINGLE PASS FREE ELECTRON LASER

Abraham Szoke, Fremont, and Donald Prosnitz, Walnut Creek, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 26, 1982, Ser. No. 342,680
Int. Cl.³ H01S 3/14
U.S. Cl. 330—4.3 **2 Claims**



1. A method for increasing the efficiency of a free electron laser, the method comprising the steps of:

providing a relativistic beam of electrons, each having electrical charge e, with a plurality of associated energies grouped around a sequence of energy values $E_i = mc^2\gamma_r(i)$ $(i=1,2,\ldots,n)$ where mc^2 is the rest mass of an electron and $1<\gamma_r(1)<\gamma_r(2)\ldots\gamma_r(n)$;

providing a transversely oriented wiggler magnetic field having an associated wiggler wavelength $\lambda_w=2\pi/k_w$ and field strength $B_w=\sqrt{2}mcb_w/e$ through which the electron beam passes;

providing a sequence of substantially monochromatic light beams with associated photon energies

$$H_i = \frac{hc\,k_w(\gamma_r^{(i)})^2}{\pi\left(1+\frac{b_w^2}{2k_w^2}\right)}$$

where $hc=2\times10^{-16}$ erg-cm; and

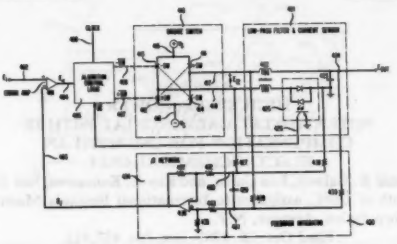
allowing each light beam to propagate parallel to and in timed relationship with the electron beam in the wiggler magnetic field region so that, as the electron beam decelerates in the magnetic field, the energy of the decelerated electrons is partially converted to and augments energy of one or more of the co-propagating light beams.

4,500,844

RINGING SIGNAL GENERATOR EMPLOYING DELTA-MODULATION POWER AMPLIFICATION TECHNIQUES

Richard J. Lisco, Whippany, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 20, 1983, Ser. No. 496,559
Int. Cl.³ H03F 3/38
U.S. Cl. 330—10 **23 Claims**



21. A method for linearly amplifying an analog reference signal of variable amplitude, said method comprising the steps of

developing an indicator signal having binary magnitudes which are indicative of the direction of amplitude variation in said reference signal,

generating, in response to said indicator signal, a control signal having different logic states including, at each indicator signal binary magnitude transition, a unique logic state of predetermined duration and different from logic states otherwise produced in response to said indicator signal,

selecting, in response to said different logic states, other than said unique logic state, one or the other of two polarities of a voltage supply having at either polarity magnitude substantially greater than any magnitude of said reference signal, and selecting, in response to said unique logic state, neither of said two polarities, and

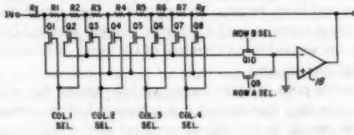
filtering an output of said selecting step to integrate such output and remove high-frequency components therefrom.

4,500,845

PROGRAMMABLE ATTENUATOR

George J. Ehni, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 15, 1983, Ser. No. 475,573
Int. Cl.³ H03G 3/30
U.S. Cl. 330—86 **12 Claims**

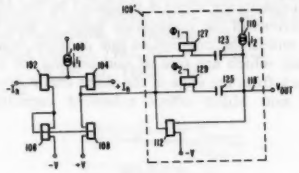


4. The attenuator of claim 3 wherein said selective coupling means comprises row select means and column select means.

4,500,846
CIRCUIT FOR EFFECTING IMPROVED SLEW RATE OF OPERATIONAL AMPLIFIERS

Lanny L. Lewyn, Palo Alto, and Charles H. Lucas, Newport Beach, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Apr. 20, 1983, Ser. No. 486,644
Int. Cl.³ H03F 3/16, 3/45
U.S. Cl. 330—253 8 Claims



1. In an operational amplifier, including an output stage amplifier and a stabilization capacitor connected between the output terminal of said output stage amplifier and a terminal of said output stage amplifier which is utilized for receiving input signals, said operational amplifier controlled by a clock pulse train so as to output a first signal in a first operating mode and to output a second signal in a second operating mode, the improvement comprising:

a first switch connected in series with, and to one terminal of, said stabilization capacitor;

a second switch;

a second capacitor connected serially to said second switch at one terminal of said second capacitor;

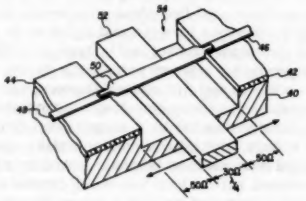
said second switch and connected second capacitor being connected in parallel, with said first switch and stabilization capacitor, between said terminal for receiving input signals and the output terminal of said output stage amplifier; and

at least one external clock pulse train coupled to and controlling said first and second switches.

4,500,847
TRANSISTOR AMPLIFIER VARIABLE MATCHING TRANSFORMER APPARATUS

Ben R. Hallford, Wylie, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 14, 1982, Ser. No. 388,291
Int. Cl.³ H03F 3/16
U.S. Cl. 330—277 8 Claims



1. Apparatus for matching a transmission line to a transistor input impedance comprising, in combination:

signal supply means;

transistor means including signal input means;

transmission line means connecting said signal supply means to said signal input means;

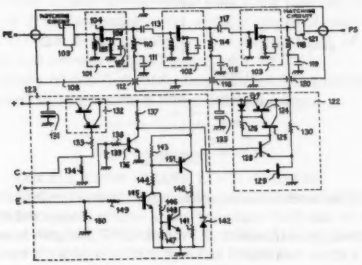
quarter-wavelength signal reflection means adjacent said transmission line means; and

means for moving said reflection means in a direction parallel to an axis of said transmission line while remaining adjacent said transmission line to adjust the relative values of resistive and reactive impedances as seen by said signal input means of said transistor means the reflection means being designed whereby the reflection coefficient angle increases with increases in frequency of operation.

4,500,848
FIELD EFFECT TRANSISTOR MICROWAVE AMPLIFIER

Maurice Marchand, and Yan Haëntjens, both of Boulogne Billancourt, France, assignors to LMT Radio Professionnelle, Billancourt, France

Filed Aug. 20, 1982, Ser. No. 409,852
Claims priority, application France, Aug. 25, 1981, 81 16215
Int. Cl.³ H03G 3/10; H03F 3/16
U.S. Cl. 330—285 4 Claims



1. A microwave amplifier for Doppler radar, comprising:

an input matching circuit for receiving an input signal to be amplified;

at least one pre-amplifier stage connected to said input matching circuit, said at least one pre-amplifier stage having a self-biassed field effect transistor whose standing wave ratio is substantially constant under a variable supply voltage;

an output matching circuit connected to said at least one pre-amplifier stage for delivering the amplified output signal; and

an adjustable voltage regulator for supplying said at least one pre-amplifier stage with a variable voltage which modifies the gain of the amplifier, said voltage regulator comprising: a transistor operating as a variable resistor, depending on the signal received at its gate, for regulating the output voltage of the regulator; and an amplifier for receiving an analog modulation signal and applying this amplified signal to the gate of the transistor operating as a variable resistor.

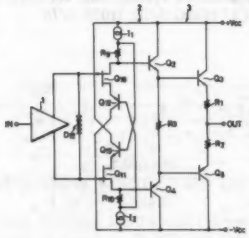
4,500,849
LOW NOISE POWER AMPLIFIER CIRCUIT

Kazuaki Nakayama, Tokyo, Japan, assignor to Pioneoer Electronic Corporation, Tokyo, Japan

Filed Feb. 4, 1983, Ser. No. 463,764
Claims priority, application Japan, Feb. 5, 1982, 57-17930
Int. Cl.³ H03F 3/16, 3/26
U.S. Cl. 330—300 3 Claims

1. A low noise power amplifier circuit comprising: an NPN first transistor having a collector connected to a positive terminal of a power supply; a first resistor coupled between an emitter of said first transistor and an output terminal; a PNP second transistor having a collector connected to a negative terminal of said power supply; a second resistor connected between an emitter of said second transistor and said output terminal; an NPN third transistor having a collector connected to said positive terminal and an emitter connected to a base of said first transistor; a PNP fourth transistor having a collector

connected to said negative terminal and an emitter connected to a base of said second transistor; a third resistor connected between said bases of said first and second transistors; an NPN fifth transistor having a collector connected to said positive terminal; a first constant current source connected between said positive terminal and a base of said fifth transistor; a fourth resistor connected between said base of said fifth transistor and a base of said third transistor; a PNP sixth transistor having a collector connected to said negative terminal; a second constant current source connected between said negative terminal and a base of said sixth transistor; a fifth resistor connected between said base of said sixth transistor and said base of said fourth transistor; a first multi-junction diode connected between said bases of said third and fourth transistors; an N-channel FET seventh transistor having a drain connected to an emitter of said fifth transistor and a source connected to said base of said third transistor; a P-channel FET eighth transistor having a drain connected to an emitter of said sixth transistor and a source connected to said base of said fourth transistor; a sixth resistor connected between gates of said seventh and eighth transistors; a voltage amplifier having positive and negative outputs; a seventh resistor connected between said positive output of said voltage amplifier and said gate of said seventh transistor; an eighth resistor connected between said negative output of said voltage amplifier and said gate of said eighth transistor; and a second multi-junction diode connected between said positive and negative outputs of said voltage amplifier.

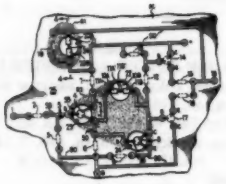


4,500,850

AUDIO AMPLIFIER APPARATUS WITH MINIMUM NON-LINEAR DISTORTION

Robert Grodinsky, 4448 W. Howard St., Skokie, Ill. 60076

Filed Oct. 22, 1981, Ser. No. 313,658
Int. Cl.³ H03F *3/04*
U.S. Cl. 330—307 **9 Claims**



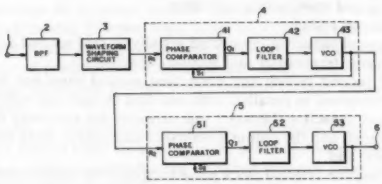
1. In an audio amplifier apparatus including an audio amplifier circuit formed by impedance and amplifying elements supported on an insulating circuit board including spaced conductive strips on at least one side of said board defining current paths to and from said discrete elements, said discrete elements having terminal leads connected between otherwise disconnected spaced conductive strips, one of said amplifying elements having at least one pair of terminals at the ends of the leads extending therefrom where the capacitance effect therebetween is enhanced by the Miller effect, said circuit board having applied thereto on the side thereof containing said conductive strips an insulating coating which covers and insulates said conductive strips except at the points where said lead connections to the conductive strips are made, the improvement in means for reducing distortion introduced by nonlinearities in the stray capacitance between said lead ends where said Miller effect is operative, said means being the placement of said amplifying elements having said terminals where the capacitance effect is enhanced by the Miller effect and the portions of the conductive strips to which they are connected within the confines of one or more regions of the circuit board which are free of said coating for a sufficient distance back from the ends of the strips that it does not contribute to said Miller effect enhanced capacitance nonlinearity.

4,500,851

PLURAL PHASE LOCK LOOP SIGNAL REGENERATION CIRCUIT

Buntaro Sawa, Sagamihara, and Naoto Honda, Hino, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 22, 1982, Ser. No. 452,100
Claims priority, application Japan, Dec. 23, 1981, 56-206974
Int. Cl.³ H03L *7/00*
U.S. Cl. 331—2 **4 Claims**



1. A signal regeneration circuit comprising:

a first phase-locked loop including a first phase comparator serially coupled to a first loop filter and a first voltage controlled oscillator serially coupled to said filter, said first phase-locked loop having a predetermined, wide loop band-width capable of avoiding the influence of any temporary phase error between an input signal and an output signal of said voltage controlled oscillator, said first phase comparator receiving at one input terminal thereof a signal to be regenerated and receiving at a second input terminal thereof said output signal of said voltage controlled oscillator, said first phase comparator detecting a first phase difference between said signal to be regenerated and the output signal of said voltage controlled oscillator to produce a train of pulses each having a width corresponding to said first phase difference; and

a second phase-locked loop including a second phase comparator serially coupled to a second loop filter and a second voltage controlled oscillator serially coupled to said second filter, said second phase-locked loop having a predetermined, narrow loop bandwidth capable of attenuating noise superposed on said signal to be regenerated, said second phase comparator being a phase frequency comparator receiving at one input terminal thereof the output signal of said first voltage controlled oscillator of said first phase-locked loop and receiving at a second input terminal thereof an output signal from said second voltage controlled oscillator, said second phase comparator detecting a second phase difference between the output signal of said first voltage controlled oscillator and the output signal of said second voltage controlled oscillator to produce a train of pulses whose logic level can be "HIGH" or "LOW" and whose width is proportional to

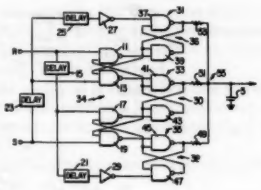
said second phase difference, and to produce a signal whose logic level is neither "HIGH" nor "LOW" during a period when said output signals from said first and second voltage controlled oscillators are in the same phase, whereby the output signal of said second voltage controlled oscillator is a regeneration signal.

4,500,852

WIDE RANGE PHASE DETECTOR UTILIZING A PLURALITY OF STACKED DETECTOR MODULES

Donald E. Phillips, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 13, 1982, Ser. No. 449,121
Int. Cl.³ H03L *7/06*
U.S. Cl. 331—12 **5 Claims**



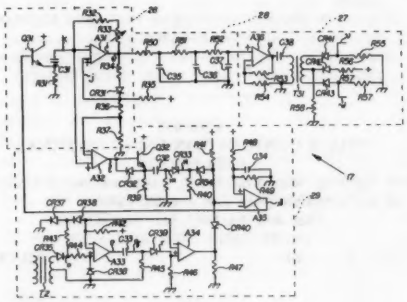
5. A phase detector comprising:
a first terminal coupled to receive a first pulse stream;
a second terminal coupled to receive a second pulse stream;
a first delay circuit having an input coupled to receive said first pulse stream and an output providing a first delayed output of said first pulse stream;
a second delay circuit having an input coupled to the output of said first delay circuit and an output providing a second delayed output of said first pulse stream;
a third delay circuit having an input coupled to receive said second pulse stream and an output providing a first delayed output of said second pulse stream;
a fourth delay circuit having an input coupled to the output of said third delay circuit and an output providing a second delayed output of said second pulse stream;
a first inverter having an input coupled to the output of said fourth delay circuit and an output providing an inversion of said second delayed output of said second pulse stream;
a second inverter having an input coupled to the output of said second delay circuit and an output providing an inversion of said second delayed output of said first pulse stream;
a first NAND gate having first and second inputs and an output, the first input of said first NAND gate being coupled to the output of said first inverter;
a second NAND gate having first and second inputs and an output, the first input of said second NAND gate being coupled to the output of said first NAND gate, and the output of said second NAND gate being coupled to the second input of said first NAND gate;
a third NAND gate having first and second inputs and an output, the first input of said third NAND gate being coupled to said first terminal and the output of said third NAND gate being coupled to the second input of said second NAND gate;
a fourth NAND gate having first and second inputs and an output, the first input of said fourth NAND gate being coupled to the output of said first NAND gate and the second input of said fourth NAND gate being coupled to the output of said third delay circuit;
a fifth NAND gate having first and second inputs and an output, the first input of said fifth NAND gate being coupled to the output of said fourth NAND gate;
a sixth NAND gate having first and second inputs and an output, the first input of said sixth NAND gate being coupled to the output of said fifth NAND gate and the output of said sixth NAND gate being coupled to the second input of said fifth NAND gate and third NAND gate;
a seventh NAND gate having first and second inputs and an output, the first input of said seventh NAND gate being coupled to the output of said first delay circuit and the output of said seventh NAND gate being coupled to the input of said sixth NAND gate;
an eighth NAND gate having first and second inputs and an output, the first input of said eighth NAND gate being coupled to the output of said fifth NAND gate and the second input of the eighth NAND gate is coupled to said second terminal;
a ninth NAND gate having first and second inputs and an output, the first input of said ninth NAND gate being coupled to the output of said eighth NAND gate;
a tenth NAND gate having first and second inputs and an output, the first input of said tenth NAND gate being coupled to the output of said ninth NAND gate, the second input of said tenth NAND gate being coupled to the output of said second inverter, and the output of said tenth NAND gate being coupled to the second input of said ninth and seventh NAND gates; and
said outputs of said first, fifth and ninth NAND gates being coupled in common as a phase detector output.

4,500,853

OSCILLATOR PHASE LOCK SYSTEM

Francis J. Stifter, Natick, Mass., assignor to Electronic Specialists, Natick, Mass.

Division of Ser. No. 548,517, Nov. 3, 1983,. This application Mar. 19, 1984, Ser. No. 590,899
Int. Cl.³ H03L *7/08*
U.S. Cl. 331—18 **15 Claims**



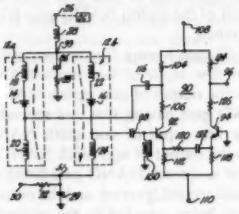
1. A phase-lock system comprising:
oscillator means providing a switching output that continuously switches between first and second states;
a trigger circuit for inducing said switching of said oscillator means;
a sensing circuit monitoring said switching output and providing an anticipating indication of an imminent switching thereof from said first to said second state;
primary voltage source means providing a variable voltage that periodically varies from and returns to a given voltage level;
a detector circuit monitoring said variable voltage and detecting the presence of said given voltage level; and
a synchronizing circuit responsive to said sensing and detector circuits and providing an input to said trigger circuit, said synchronizing circuit operative to cause switching of said oscillator means in response to the simultaneous provision of said anticipating indication by said sensing circuit and detection of said given level by said detector circuit.

4,500,854

VOLTAGE-CONTROLLED RF OSCILLATOR EMPLOYING WIDEBAND TUNABLE LC RESONATOR

Donald G. Meyer, Sultan, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Apr. 20, 1981, Ser. No. 255,675
Int. Cl.³ H03H 7/12; H03B 5/18; H01P 7/08
U.S. Cl. 331—117 R **17 Claims**



1. An LC resonant circuit wherein the value of capacitance employed is not substantially greater than the value of stray capacitance associated with the inductive structure utilized in said resonant circuit, comprising first and second circuit branches connected in parallel with each other, each of said circuit branches comprising, in series, a voltage variable capacitive element and first and second inductors, said first and second inductors having substantially equal values of inductance and said capacitive element being connected between said inductors to establish voltages of equal magnitude and opposite phase at opposite ends of said capacitive element when said circuit branch resonates;

first circuit means for applying a source of DC bias at the nodes interconnecting said first and second circuit branches to control said voltage variable capacitive elements;

input signal means for applying an input signal to one of said first and second circuit branches; and

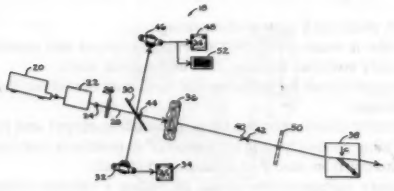
output circuit means for obtaining an output signal from the other one of said first and second circuit branches.

4,500,855

PHASE CONJUGATION USING INTERNAL REFLECTION

Jack Feinberg, Manhattan Beach, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Jun. 10, 1982, Ser. No. 387,068
Int. Cl.³ H01S 3/098, 3/23, 3/30
U.S. Cl. 332—7.51 **21 Claims**



1. A method of producing a phase conjugate replica of an incoming light beam using a body of mixing material which lacks inversion symmetry and has an optical coupling strength of at least approximately one per millimeter, comprising the steps of:

causing the incoming beam to enter the mixing material; and

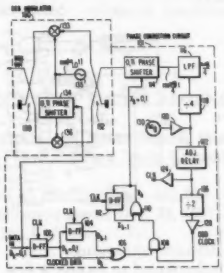
adjusting the orientation of the mixing material relative to the incoming beam such that at least one auxiliary beam splits off from the incoming beam within the material, is internally reflected by the surface of the material and returns to the incoming beam within the material for scattering as an oppositely directed phase conjugate replica thereof.

4,500,856

SIMPLIFIED MINIMUM SHIFT KEYING MODULATOR

William H. Childs, Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Dec. 15, 1981, Ser. No. 330,917
Int. Cl.³ H03C 3/02; H04L 27/12
U.S. Cl. 332—9 R **11 Claims**



1. An MSK modulator comprising:

a single-sideband modulator receiving an input data signal as a modulating signal;

a source of an IF signal; and

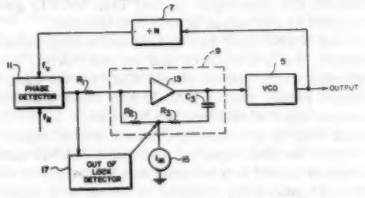
means for coupling said IF signal to an IF signal input of said single sideband modulator with a phase such that an output signal from said single sideband modulator has phase continuity for all bit combinations of said input data signal.

4,500,857

FREQUENCY MODULATED PHASE LOCKED LOOP

Robert J. Bosselaers, Winchester, and Richard B. Elder, Acton, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 24, 1983, Ser. No. 469,333
Int. Cl.³ H04L 27/12
U.S. Cl. 332—9 R **4 Claims**

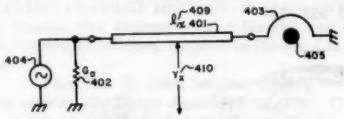


1. A phase locked loop adapted for frequency modulation by means of a digital modulation signal, comprising a phase detector to which a reference signal and a signal related to the output frequency of a voltage controlled oscillator are applied, a loop filter connecting the output of said phase detector to the control input of said voltage controlled oscillator, means to apply a digital modulation signal to said loop filter in such a way that a desired modulation characteristic for square wave frequency modulation results and wherein said phase locked loop also has a time constant which results in a desired short loop settling time.

4,500,858
METHOD FOR ENHANCING FERROMAGNETIC COUPLING

John A. Mezak, San Jose, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 10, 1982, Ser. No. 448,689
Int. Cl.³ H01P 1/20, 5/02, 1/218
U.S. Cl. 333—202 2 Claims



1. A method for reducing the change in input and output resonator bandwidth of a loop coupled ferromagnetic resonator filter by compensating for variations in coupling over multi-octave tuning ranges comprising:

determining the variation in bandwidth due to the coupling loop acting as a transmission line transformer transforming respective source or load admittance G_o to an equivalent conductance G_p;

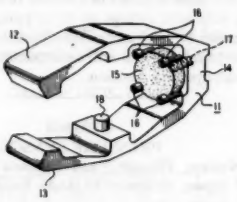
determining bandwidth variation selectively as a function of frequency; and

compensating said bandwidth variation with a frequency selective compensating transmission line providing a variation in bandwidth determined by said second step oppositely to and compensating said variation in bandwidth due to said coupling loop acting as a transmission line transformer, whereby to compensate coupling variation with frequency, and provide a substantially constant passband over multi-octave ranges.

4,500,859
FILTER FOR EXISTING WAVEGUIDE STRUCTURES

Chung-Li Ren, Andover; Matthew V. Thompson, Bradford, and Han-Chiu Wang, Andover, all of Mass., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 5, 1983, Ser. No. 482,056
Int. Cl.³ H01P 1/207, 7/10, 1/00
U.S. Cl. 333—208 5 Claims



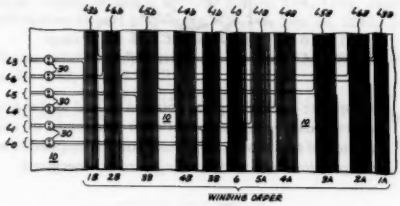
1. A device for holding a cylindrical resonator rigidly in a predetermined position within a waveguide comprising

a resilient unitary body bifurcated into two portions connected by a bridging portion, the bridging portion bearing against the central region of a first wall of the waveguide and maintaining a predetermined distance between said resonator and the first wall, the bridging portion of the bifurcated body accommodating a metal screw whose axis is colinear with the axis of the cylindrical resonator for tuning its resonant frequency, each of said two portions having a centrally located bearing surface each resting against a central region of one of two opposite walls each intersecting opposite ends of said first wall of the waveguide, and said two portions having end bearing surfaces contacting the central region of the remaining wall of said waveguide opposite said first wall.

4,500,860
WINDING SUPPORT AND METHOD FOR NMR MAGNET AXISYMMETRIC CORRECTION COILS

Mark E. Vermilyea, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 5, 1984, Ser. No. 628,077
Int. Cl.³ H01F 7/22
U.S. Cl. 335—216 22 Claims



1. A coil form, especially for supporting superconductive windings for axial NMR magnetic field correction coils, said form comprising:

an insulative cylinder;

said cylinder having at least two circumferential slots therein at a depth of approximately h from the surface of said cylinder;

said cylinder also having a first axial groove therein at a depth of approximately h+d from the surface of said cylinder, said groove extending at this depth for a substantial portion of the length of said first groove, said first axial groove extending between said circumferential slot, said first axial groove also having two ramped transition portions from the depth of said first groove to the depth of said circumferential slots, said ramped transition portions each being disposed adjacent to one of said circumferential slots, said coil forms also exhibiting two rounded corners at the junction of said first axial groove and said circumferential slots;

said cylinder also having a second axial groove therein at a depth of approximately h+d from the surface of said cylinder, said second axial groove extending at this depth for a substantial portion of the length of said second groove, said second axial groove extending at said depth of h+d across all of a first one of said circumferential slots, said second axial groove extending at said depth of h+d across almost all of the second of said circumferential slots, said second axial groove also having a ramped transition portion from the depth of said second groove to the depth of the second of said circumferential slot, said ramped portion extending in the circumferential direction, said coil form also exhibiting a rounded corner at the junction of said second axial groove and the ramped portion of said second axial groove at the point where said second axial groove changes direction.

4,500,861
SECTOR MOTOR HAVING LATCHING MEANS FOR ROTOR IN MULTIPLE POSITIONS

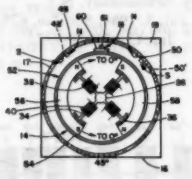
Victor H. Nelson, 10 Redwood Dr., Dix Hills, N.Y. 11746

Filed Feb. 17, 1983, Ser. No. 467,244
Int. Cl.³ H01V 7/08
U.S. Cl. 335—253 10 Claims

1. In a three position sector motor of the type having a housing an armature having a plurality of magnetic arms, each arm carrying a coil winding adapted to be selectively energized and a pair of cylindrically curved permanently magnetized pole pieces of opposite polarity circumferentially spaced apart and surrounding said armature the improvement comprising:

a mechanical stop means for limiting angular rotation of said motor; and

a latching means for holding said motor in stopped positions



at opposite ends of angular rotation of said motor and in a central position midway between said ends of angular rotation of said motor, when said rotor is stopped in any of said positions and said windings are de-energized.

4,500,862

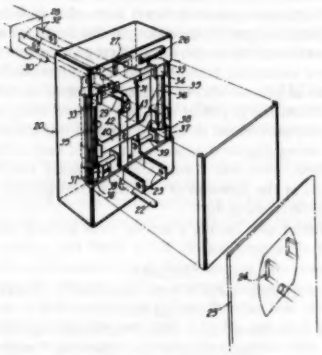
POWER SOURCE ISOLATOR

Harold E. Shedd, Rte. 1, Box 242, Nicholson, Ga. 30565

Filed Feb. 18, 1983, Ser. No. 467,947

Int. Cl.³ H01H *39/00*

U.S. Cl. 337—32 **9 Claims**



1. A power surge isolator and grounding device for the protection of electrical appliances comprising an insulating casing having male conducting prongs projecting from one side thereof for entry into a wall outlet and also having on its opposite side a female receptacle to receive the pronged plug of an appliance power cable, at least a pair of fuses in the casing through which normal operating current required by an appliance can be delivered and which fuses will blow when subjected to current significantly above said normal appliance current, said fuses having opposite end electrical terminals, conducting clips in the casing embracing corresponding end terminals of the fuses and being electrically connected with said male conducting prongs, additional conducting clips in the casing embracing the other end terminals of the fuses and being electrically connected with contact elements of the female receptacle, a grounding conductor element within the casing electrically connected to ground elements of the female receptacle and male conducting prongs, and a power stop conductor within the casing electrically connected to said grounding conductor and having clips embracing the glass envelopes of the fuses in relatively closely spaced relationship to corresponding end terminals of the fuses and relatively distantly spaced relationship to the opposite end terminals of the fuses.

4,500,863

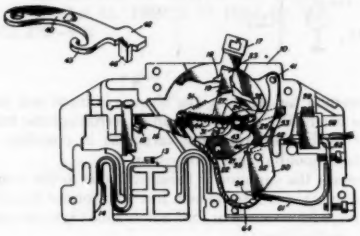
CIRCUIT BREAKER HAVING AN INTEGRATED POWER TRAP ARM

Luis F. Sepulveda, Fajardo, P.R., assignor to Challenger Caribbean Corporation, Canovanas; Challenger Zinsco, Inc., Rio Piedras, both of, P.R. and Commander Electrical Equipment, Inc., Scarborough, Canada

Filed Jun. 24, 1983, Ser. No. 507,609

Int. Cl.³ H01H *73/24*

U.S. Cl. 337—70 **3 Claims**



1. In a circuit breaker of the type including a contact carrier pivoted for movement between circuit-closing and -opening positions respectively, a tension spring connected at one end to the contact carrier, a latch pivoted to swing between a latching and a release position, and a thermostatic element that normally restrains the latch from movement to its release position and deflects in the presence of an overload current to free the latch for movement to its release position, the improvement comprising a one-piece, generally flat trip arm one end of which provides a pivot axis about which the arm is swingable between retracted and tripping positions respectively, the trip arm having a midportion connected to the other end of the spring, the spring being tensioned to bias the trip arm toward the contact carrier, the trip arm at its other end having an end portion formed for engagement with the latch when the trip arm and latch are in their retracted and latching positions respectively, the trip arm being further integrally formed at said other end thereof with an impact lug extending perpendicularly to the general plane of the arm in a direction such that when the trip arm swings to its tripping position with the contact carrier in its circuit closing position, the carrier will be in the path of the lug and will be impacted thereby and driven to its circuit-opening position.

4,500,864

PRESSURE SENSOR

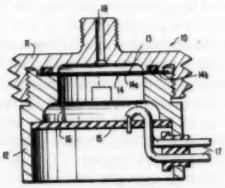
Takeshi Nakane, Okazaki, and Katsumi Nakagawa, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 5, 1983, Ser. No. 511,029

Claims priority, application Japan, Jul. 5, 1982, 57-116423

Int. Cl.³ G01L *1/22*

U.S. Cl. 338—4 **6 Claims**



1. A pressure sensor having a strain gauge for converting

fluid pressures into electrical signals comprises a diaphragm adapted to be tensioned under pressure, a casing member supporting said diaphragm and resistance body means of amorphous metal material comprised of nickel, silicon and boron for operating said strain gauge formed on said diaphragm by means of a physical vapor deposition process.

4,500,865

FLUID LEAKAGE DETECTING ELEMENT

Yoshito Tanaka; Ken Ichiryu, both of Ibaraki, and Naohiko Iwata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 19, 1983, Ser. No. 459,211
Claims priority, application Japan, Feb. 26, 1982, 57-29018
Int. Cl.³ H01C *7/00, 1/012;* **G01N** *25/72*
U.S. Cl. 338—13 **8 Claims**

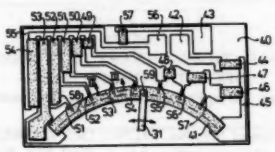
1. A fluid leakage detecting element comprising a substrate of electrical insulating material having a high thermal conductivity and having two opposing surfaces, one of which is adopted to be attached to a portion of a subject where a fluid contained in said subject may leak, a heat generating resistive member, said member being provided in thick film form on the other surface of said substrate and made of tungsten which has a high temperature coefficient, a high thermal conductivity and a melting point higher than the baking temperature of said substrate, wherein an insulating coating of alumina is provided covering the surface of said resistive member and wherein said substrate is bonded to said tungsten resistive member, and a heat insulator of a material which is sufficiently resistive to chemicals and heat and has a low thermal conductivity is disposed on said attachable surface of said substrate.

4,500,866

ELECTRIC POTENTIOMETER

Peter Romann, Stuttgart; Rudolf Sauer, Benningen, and Heinrich Steinrücken, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,316
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1982, 3227805
Int. Cl.³ H01C *10/16*
U.S. Cl. 338—126 **1 Claim**



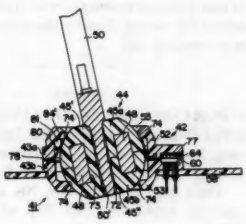
1. An electric potentiometer comprising a pickup wiper means and a resistor pad, said resistor pad having a plurality of metallic connections for parallel resistors distributed over the displacement range of said pickup means and serving as connection support points, with which the partial resistance established by said pickup means can be varied to a predetermined nonlinear value in accordance with the displacement of the pickup, and said connection support points extending in a direction crosswise to but not extending past a contact track of said pickup means sliding along said resistor pad, said connection support points extending beneath said resistor pad and terminating thereunder a distance removed from said contact track of said pickup means.

4,500,867

JOYSTICK CONTROLLER USING MAGNETOSENSITIVE ELEMENTS WITH BIAS MAGNETS

Yoshimitsu Ishitobi; Kouhei Fujii, and Fumio Nakatsuji, all of Shiga, Japan, assignors to NEC Kansai, Ltd., Otsu, Japan

Continuation-in-part of Ser. No. 420,745, Sep. 21, 1982,. This application Jun. 11, 1984, Ser. No. 619,719
Claims priority, application Japan, Jan. 13, 1982, 57-4438; May 31, 1982, 57-81537[U]
Int. Cl.³ H01C *9/00, 9/02, 10/16*
U.S. Cl. 338—128 **7 Claims**



1. A joystick controller having a control handle, comprising a stator casing (**42**) of non-magnetic material, magnetosensitive elements operatively arranged in said stator casing, rotor means (**44**) having a central axis and being operatively arranged in said stator casing, said rotor means having two substantially semispherical members (**45***a*, **45***b*) of non-magnetic material and a permanent magnet (**48**) operatively mounted in said semispherical members, said stator casing having two casing shells (**43***a*, **43***b*), each casing shell including inwardly reaching surface means (**74**) for slidingly supporting said rotor means (**44**) in said stator casing and for providing a spacing (**81**) between at least one of said shells (**43***a*, **43***b*) and said rotor means, and frustum shaped spring means (**80**) surrounding said rotor means in said spacing, said frustum shaped spring means (**80**) having tongues (**84**) extending at such an angle relative to a plane dividing said stator casing and toward said central axis, that said spring tongues (**84**) exert on said rotor means forces which are directed substantially toward the center of said rotor means for providing a certain resistance of said rotor means against rotation of the rotor means without any force components tending to separate said casing shells.

4,500,868

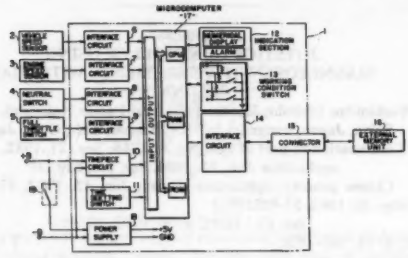
AUTOMOTIVE DRIVING INSTRUCTION SYSTEM

Naoki Tokitsu, Chiryu; Toshitaka Fujiwara, Toyota; Toranosuke Kato, Nagoya, and Toshihiko Uno, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 24, 1981, Ser. No. 324,488
Claims priority, application Japan, Nov. 26, 1980, 55-166150
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—52 F **10 Claims**

1. An automotive driving instruction system comprising:
a plurality of sensors disposed at various parts of the automobile for detecting the driving conditions of the automobile;
a computer for reading the outputs of said sensors, calculating a plurality of values representing the driving conditions of the automobile, and controlling issuance of an alarm when any of the results of the calculations of said values becomes equal to the corresponding one of predetermined settings associated with the values;
a replaceable external memory unit for storing the accumu-

lated values of said alarm, and the accumulated values of said alarm for respective causes by the processing operation of said computer, said external memory being adapted to indicate the stored data by the processing operation of a data processing unit.



4,500,869

METHOD FOR CONVERSION OF LINEARLY ENCODED INTO NON-LINEARLY ENCODED DIGITAL SIGNALS

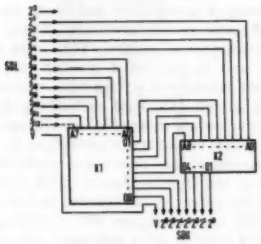
Rolf Zeitraeg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1980, Ser. No. 178,531

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1979, 2938984

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **8 Claims**



1. A method for converting a linearly encoded digital signal (SDL) into a non-linearly encoded digital signal (SDK) in accordance with a multiple segment characteristic obeying the A law or the μ law, said digital signals SDL and SDK having a sign bit (V) in the highest order position, said method comprising the steps of:

(a) supplying to a first memory (K1), as an address, at least as many higher order bits of said signal SDL, exclusive of the said sign bit V, as are necessary for identifying the segment of the characteristic into which the respective signal value falls, said first memory having stored therein a plurality of first digital words, each having a first plurality of bits defining the highest order bits of the corresponding signal SDK following the sign bit V which indicate the segment of the characteristic on which this signal value lies, plus a second plurality of bits defining a partial memory address;

(b) supplying to a second memory (K2), as a first partial address, said second plurality of bits;

(c) supplying to said second memory K2, as a second partial address, the lower order bits of said signal SDL, exclusive of the lowest order bit which is disregarded in the conversion, said second memory having stored therein a plurality of second digital words which identify the corresponding levels of the segments of the characteristic to which the values of said signal SDK are correlated;

(d) presenting the sign bit V of said signal SDL as the highest order bit of said signal SDK;

(e) reading said first plurality of bits from said memory K1 as the next highest order bits of said signal SDK; and

(f) reading said second digital words from said memory K2 as the lowest order bits of said signal SDK.

4,500,870

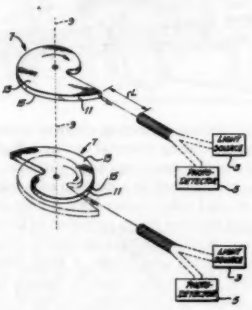
METHOD AND COMPONENTS FOR REMOTE READING OF UTILITY METERS

David A. Krohn, Hamden; Louis A. Buffone, Shelton, and Edmond I. Vinarub, Cheshire, all of Conn., assignors to Eotec Corporation, West Haven, Conn.

Filed Sep. 29, 1981, Ser. No. 306,901

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 P **31 Claims**



1. In an angular position sensor:

means for mounting a light transmitter in a first fixed position;

means for mounting a light receiver in a second fixed position; and

an element mounted for rotation about a fixed axis and having a light reflecting track, the track being so constructed on the element that points along the track progressively define a point of light incidence assuming a predefined sequence of positions as the element is rotated through a single rotation, such that each position in said sequence is at a different distance from at least one of said transmitter and said receiver, light from the transmitter being reflected from the light reflecting track onto the light receiver along an optical path having a path length that assumes unique values as the element rotates through a single rotation, whereby the amplitude of received light is uniquely related to the angular position of said element.

4,500,871

METHOD FOR CODING BINARY DATA AND A DEVICE DECODING CODED DATA

Max Ratigalas, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 192,940, Oct. 1, 1980, Pat. No. 4,394,641. This application Apr. 7, 1983, Ser. No. 482,886

Claims priority, application France, Oct. 1, 1979, 79 24419

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **2 Claims**

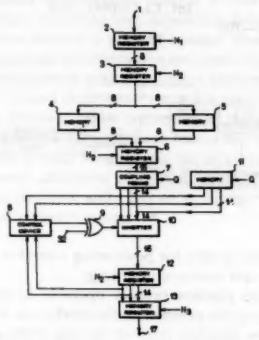
1. A method for preparing an input signal for transmission, said input signal having a sequence of groups selected from a set of all possible groups, each of said groups having n binary digits having a repetition frequency F, said method comprising the steps of:

generating for each of said groups in said set a unique binary word each of said words being defined by n bits having a "0" state and n bits having a "1" state and having a repetition frequency 2F, each of the bits of said words being

adjacent to a bit having the same state except end bits of said words which can be adjacent a bit in said word of opposite state;

generating the complement of at least some of said words; and

forming a transmission signal by replacing the n bits of each



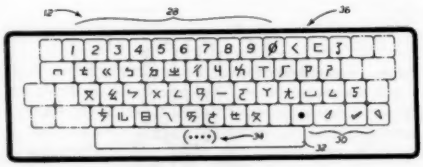
of said groups in said input signal with the 2n bits of one of the word and the complement of the word uniquely corresponding to said group which ensures that both the last bit of the word previously generated and the first bit of the word presently generated are adjacent bits of the same state when both said previously generated word and said presently generated word are considered together.

4,500,872

METHOD FOR ENCODING CHINESE CHARACTERS

Timothy D. Huang, Portland, Oreg., assignor to DAI-E Systems, Inc., Portland, Oreg.

Filed Mar. 18, 1982, Ser. No. 359,374
Int. Cl.³ G06F *3/02*; B41J *5/00*
U.S. Cl. 340—365 R **7 Claims**



1. A method of encoding, uniquely, different characters in the Chinese language comprising

associating with a selected character a phonetic tag therefor formed with no less than one, and no more than three, recognized Chinese phonetic symbols,

associating with such selected character a tone tag therefor comprising but a single recognized Chinese tone symbol,

associating with such selected character a two-digit-only number tag, each digit of which is associated, respectively, with two different ones only of the four recognized corner configurations in the character, and

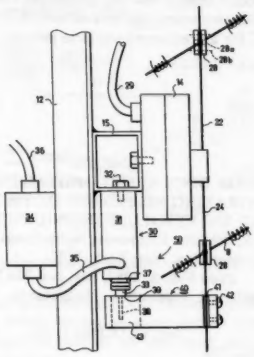
assembling such tags in a preselected sequence.

4,500,873

TESTING DEVICE FOR AN INTRUSION DETECTION SYSTEM

Chaim Porat, and Yaacov Sadeh, both of Beer-Sheva, Israel, assignors to Beta Engineering & Development Ltd., Beer Sheva, Israel

Filed Sep. 15, 1982, Ser. No. 418,455
Claims priority, application Israel, Feb. 3, 1982, 64923
Int. Cl.³ G08B *29/00*
U.S. Cl. 340—515 **10 Claims**



1. An intrusion detection system including at least one sensor wire coupled to a detector for detecting an attempted intrusion by producing an electrical signal when sensing an external force applied to the sensor wire, characterized in that said system further includes:

a testing device adapted to be actuated from a central station to apply a mechanical force to said sensor wire in order to cause same to simulate an intrusion;

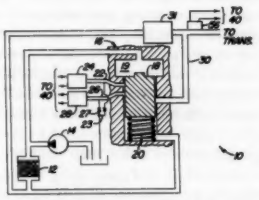
and a testing circuit including means at said central station for actuating said testing device, and an indicator at said central station connected to receive the signal from said detector and thereby to indicate the actual response of said detector to said mechanical force.

4,500,874

FILTER MONITORING SYSTEM

Stephen F. Jacobi, Cedar Falls; Robert E. Haight, Waterloo; John W. Schletzbaum, Hudson; Yolanda E. Martin, Cedar Falls, and Stephen P. Lang, Waterloo, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jun. 17, 1982, Ser. No. 378,703
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—607 **4 Claims**



1. A system for monitoring the condition of a filter in a hydraulic circuit, comprising:

first and second pressure-responsive switches operable in response to first and second levels, respectivley, of restriction in the filter;

first and second indicators energizable to produce first and

second sensibly dissimilar operator-detectable warning signals; and

a monitor circuit coupled to the switches and to the indicators, the monitor circuit including means for energizing both indicators in response to operation of only one of the switches and for preventing energization of both indicators unless the one switch is operated continuously for a certain time period, the monitoring circuit also including means for energizing one of the indicators and de-energizing the other of the indicators in response to operation of the second switch and for preventing energization of the one indicator unless the second switch is operated continuously for a predetermined time period.

4,500,875

DEVICE FOR DISPLAYING DIGITAL INFORMATION INCORPORATING SELECTION OF PICTURE PAGES AND/OR RESOLUTION ENHANCEMENT

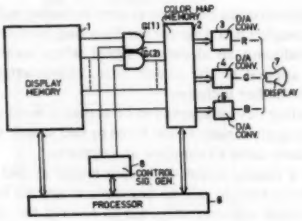
Herman J. R. Schmitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,702

Claims priority, application Netherlands, Mar. 19, 1981, 8101339

Int. Cl.³ G09G *1/28*

U.S. Cl. 340—703 **8 Claims**



1. A device for arranging digital information as a set of pixels which are displayed according to a line pattern in a two-dimensional area, said device comprising:

a display memory for the storage of said digital information, an m-bit ($m > 1$) information word being stored for each of said pixels to be displayed, said display memory comprising a data output for outputting said m-bit information words;

a programmable color map memory for the storage of color information, said color map memory having a data output for outputting color information and an address input;

means for generating control signals;

means for connecting said data output of said display memory to said address input of said programmable color map memory, said connecting means comprising at least one connection line having a gate circuit including a first gate input connected to said data output of said display memory, a gate output connected to said address input of said programmable color map memory, and a control input connected to said generating means for receiving control signals, said gate circuit passing to said gate output, under the control of a first control signal applied at said control input, a first address comprising the m-bit information word to be displayed, said gate circuit also passing to said gate output, under the control of a second control signal applied at said control input, a second address comprising a selectable part of the m-bit information word to be displayed.

4,500,876

CONTROL SYSTEM FOR POSITIONING A MARKER ON A CATHODE-RAY TUBE DISPLAY

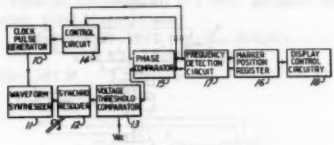
Brian B. English, Edinburgh, and Hamish W. M. Gray, Lothian, both of Scotland, assignors to Ferranti plc, Cheadle, England

Filed Mar. 18, 1982, Ser. No. 359,310

Claims priority, application United Kingdom, Mar. 23, 1981, 8108547

Int. Cl.³ G09G *1/00*

U.S. Cl. 340—709 **17 Claims**



1. A control system for positioning a marker on a cathode-ray display, said system comprising:

at least one position register operable to store a number identifying the position of the marker on the display;

at least one synchro resolver having rotor and stator elements, a pair of input windings on one of said rotor and stator elements and an output winding on the other of said rotor and stator elements;

means for applying a sinewave energising signal to one of said pair of input windings and a cosinewave energising signal to the other of said pair of input windings such that the output winding delivers a signal having a sinusoidal waveform differing in phase from one of the energising signals by an extent dependent upon the angular position of said rotor relative to said stator;

circuitry responsive to the output winding signal for producing an output pulse corresponding to each predetermined increment of rotation of said rotor; and

circuitry for changing the number stored in said position register as a function of the output pulses.

4,500,877

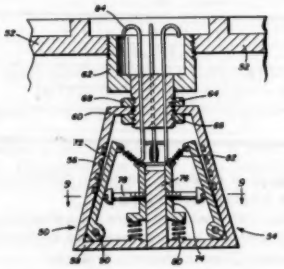
CHANGEABLE CIRCUIT CONTROLLING SWITCH ASSEMBLY

Joseph H. Molat, Stratford 36C, West Palm Beach, Fla. 33409

Division of Ser. No. 165,227, Jul. 1, 1980, Pat. No. 4,384,720. This application Feb. 8, 1983, Ser. No. 464,976

Int. Cl.³ G09F *9/30*; H01H *17/14*

U.S. Cl. 340—711 **5 Claims**



1. In a control board assembly, a display panel divided into a plurality of zones, manually operable means displaceable between inactive and active positions at each of said zones for registration of selected ones of the zones, indicator means operatively connected to the manually operable means for

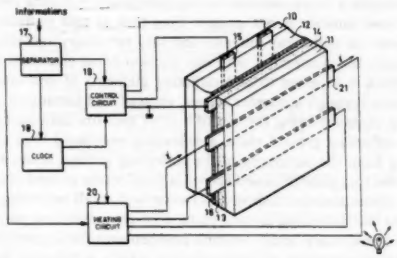
signifying registration of a group of the zones in a predetermined pattern, means cooperating with the manually operable means for holding thereof in the inactive position at each of said zones, and changeable means associated with the holding means and the manually operable means at each of the zones for changing the predetermined pattern signified by the indicator means, said manually operable means including a switch housing mounted in underlying relation to said display panel having a contact mounting wall depending from the panel in angular relation thereto, a pivoted contact element biased to the inactive position, slidable means mounted within the switch housing and engageable with the contact element for displacement thereof toward the contact mounting wall from the inactive position, actuator means connected to the slidable means for displacement thereof, and guide means through which the actuator means extends for exposing the actuator means above the display panel, additional contact mounting walls, and associated contact elements, and a plurality of actuator rods associated with said actuator means.

4,500,878

THERMOELECTRICALLY CONTROLLED ELECTROCHROMATIC VISUALIZATION DEVICE

Michel Hareng, and Paul Moutou, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 27, 1982, Ser. No. 424,762
Claims priority, application France, Dec. 15, 1981, 81 23437
Int. Cl.[3] G09G *3/34*
U.S. Cl. 340—713 **6 Claims**



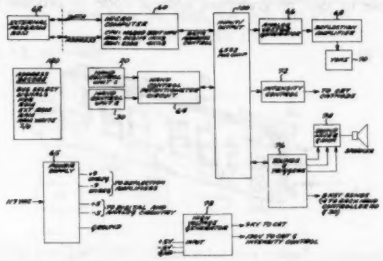
1. A electrically controlled visualization device comprising:
an electrochromatic material placed between a first electrode means and a second electrode means wherein said first and second electrode means are each supported respectively by two plates with at least one of said plates being transparent;
a voltage source connected to said first electrode means;
heating current generating means for producing an electric heating current provided for said second electrode means whereby said voltage source and said heating current generating means produce a displacement of ions by diffusion which modifies the nature of said material;
control means connected to said voltage source and said heat current generating means for controlling the application of said voltage and said current from said heat current generating means in order to provide for control of an electrochromatic effect caused by said displacement of ions by diffusion.

4,500,879

CIRCUITRY FOR CONTROLLING A CRT BEAM

Jay Smith, III, Pacific Palisades, and Gerald S. Karr, Venice, both of Calif., assignors to Smith Engineering, Culver City, Calif.

Filed Jan. 6, 1982, Ser. No. 337,332
Int. Cl.[3] G06F *3/14;* H01J *29/70*
U.S. Cl. 340—739 **2 Claims**



1. Apparatus for drawing vectors on a CRT display, comprising:
digital-to-analog converter (DAC) means having an output;
first storing means having an input and an output for sampling a signal presented to said input and holding the sample as said output;
a second storing means having a second input and a second output; p1 first integrator means including a first differential amplifier means having a first input and a second input, the second input being connected to the output of said second storing means;
a second integrator means including a second differential amplifier means having a first input and a second input, the second input being connected to the output of said second storing means;
first switch means responsive to a first control signal to selectively couple the output of the first storing means to said first integrator means;
second switch means responsive to a second control signal to selectively couple the DAC output to said second integrator means;
a selector means responsive to at least a third control signal for selectively coupling the analog output of said DAC means to the input of said first storing means or to the input of said second storing means;
control means for supplying said first, second and at least a third control signal to control the operation of said DAC means, said selector means and said first and second switch means, said control means being operative to cause said first switch means to close for a predetermined time after said first storing means has stored an output of the DAC means and to cause said selector means to couple said DAC output to said second storing means only when said DAC is at a zeroing point; and
deflection circuit means for coupling said integrator outputs to first and second CRT deflection coils for causing the CRT to deflect in accordance with the integrator output signals.

4,500,880

REAL TIME, COMPUTER-DRIVEN RETAIL PRICING DISPLAY SYSTEM

Earl R. Gomersall, Inverness, and Arthur F. Cipolla, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

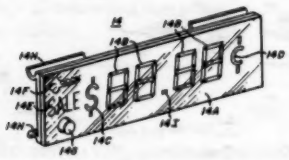
Filed Jul. 6, 1981, Ser. No. 280,663
Int. Cl.[3] G09G *3/00*
U.S. Cl. 340—825.35 **12 Claims**

1. A computer-driven informational display arrangement for

displaying selected information in real time, said arrangement comprising in combination:

a source of computer based information in the form of at least an address code in standard UPC format and information to be displayed;

a plurality of low current drain display units at selected locations, each having externally programmable memory means settable to a particular address in the form of a UPC formatted address code, said display units being responsive to said programmed address code to process and



selectively display said information following said address code;

means for applying said source of the computer based information to said plurality of display units;

means for supplying operating power to each of said plurality of display units; and

means including optical scanning means for externally programming said memory of any of said plurality of display units with a stored address code while at its said selected location.

4,500,881

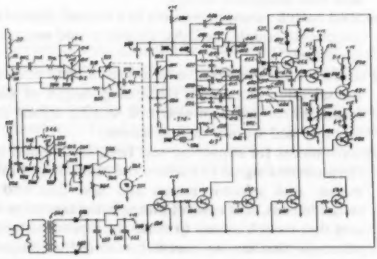
INDUCTIVELY-COUPLED SIGNALLING SYSTEM

Michael J. Beane, Apollo Beach, Fla., assignor to Liquidometer Corporation, Tampa, Fla.

Filed Sep. 23, 1982, Ser. No. 422,366

Int. Cl.[3] **H04Q** *9/12;* **H01R** *11/30*

U.S. Cl. 340—825.73 **41 Claims**



16. A signalling system to provide information from a carrier vehicle to a storage facility, comprising in combination with said vehicle and facility:

(a) a device at said vehicle, for generating waveforms,

(b) means for selecting two of said waveforms to correspond to a predetermined signal,

(c) a two-part coupling, one part comprising means connected to said generating device for radiating the waveform energy therefrom, and the other part comprising means closely coupled to said radiating means, to pick up said radiated waveform energy,

(d) holding means for normally maintaining said radiating and pick up means in close, operative proximity,

(e) said holding means enabling a non-destructive separation of said waveform radiating and pick up means in response to the application of sufficient force to said coupling parts,

(f) a cable connected to said pick up means, for carrying said picked up waveforms,

(g) a waveform decoder at the said storage facility, associated with said cable for decoding the waveforms carried by the cable, and

(h) a control device at said storage facility, responsive to said decoded waveforms.

4,500,882

ANTENNA SYSTEM

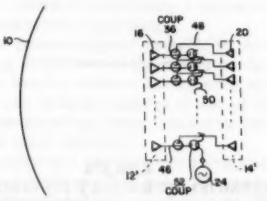
Takashi Katagi, Kanagawa, and Seiji Mano, Fujisawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1981, Ser. No. 317,847

Claims priority, application Japan, Nov. 5, 1980, 55-155536; Nov. 5, 1980, 55-155654; Nov. 5, 1980, 55-155655; Nov. 5, 1980, 55-155656; Nov. 5, 1980, 55-155657

Int. Cl.[3] **H01Q** *3/22, 3/24, 3/26*

U.S. Cl. 343—372 **12 Claims**



12. An antenna system comprising a reflector, an array antenna used as a primary radiator and positioned in front of an aperture of said reflector so as to block one portion of said aperture of said reflector, said array antenna having a plurality of radiating elements, and a subsidiary array antenna which is disposed back-to-back with respect to said array antenna, said subsidiary array antenna having subsidiary radiating elements whose number is not greater than that of said radiating elements of said array antenna and said subsidiary radiating elements being supplied with one portion of an electrical power which is supplied to said radiating elements of said array antenna through a coupler means, each of said subsidiary radiating elements being formed of a short backfire antenna having: a reflecting ground plate, a reflecting peripheral wall extending from the periphery of the reflecting ground plate, a small reflecting plate disposed above said reflecting ground plate and a dipole antenna disposed between said small reflecting plate and said reflecting ground plate; wherein a radiation pattern of said subsidiary array antenna compensates for a portion of a radiation pattern of said reflector which is blocked by said array antenna.

4,500,883

ADAPTIVE MULTIPLE INTERFERENCE TRACKING AND CANCELLING ANTENNA

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 7, 1983, Ser. No. 472,793

Int. Cl.[3] **G01S** *3/06*

U.S. Cl. 343—383 **25 Claims**

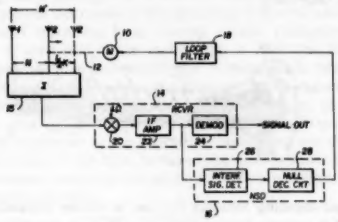
1. An adaptive array antenna for cancelling undesired signals received thereby, comprising:

a plurality of antenna elements;

means for varying the space coded positions of said plurality of antenna elements in response to a control signal to provide a 180° phase difference between one half of the number of said plurality of antenna elements with respect to the other half of the number of said antenna elements

for an undesired signal arriving at a certain space angle relative to an axis of said antenna;

receiver means coupled to said antenna elements and including means for detecting and providing an output signal of said undesired signal; and



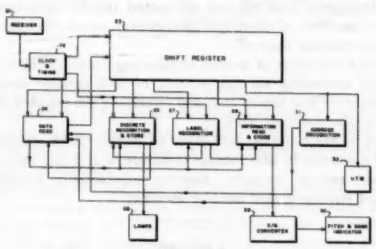
means responsive to the amplitude of said undesired output signal for generating said control signal whereby said varying means varies said spacing between said halves of antenna elements until a null of said output signal occurs and said undesired signal is cancelled.

4,500,884

DATA LINK TIMING

Henry Naubereit, Maple Shade, N.J.; Henry R. Beyer, Chalfont, Pa.; Richard G. DeSipio, Philadelphia, Pa., and Salvatore R. Picard, Hatboro, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1965, Ser. No. 455,672
Int. Cl.[3] G01S *3/02*
U.S. Cl. 343—456 **10 Claims**



1. In an automatic aircraft carrier landing system having a carrier provided with a radio transmitter for transmitting a predetermined sequence of digital information and a plurality of aircraft each having a radio receiver for receiving said sequence, a data link in each aircraft for translating said sequence into aircraft guidance information comprising:

a shift register connected to said receiver to receive said sequence;

a clock connected to advance said register at the rate of said sequence;

means to read from said register at predetermined intervals portions of said sequence; and

timing means to control the operation of said shift register and reading means, comprising:

means operable during a first portion of said sequence comprising synchronization bits to clear and lock said register, said register being unlocked by reception of a first data bit;

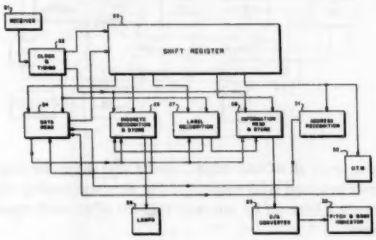
a plurality of cycle means operable after successive predetermined portions of said sequence to send timing signals to said read means to read the contents of said register, each of said cycle means being responsive to a predetermined condition of said register.

4,500,885

DATA LINK DATA AND ADDRESS RECOGNITION

Henry R. Beyer, Chalfont; Richard G. DeSipio, Philadelphia; Thomas F. Long, Warminster, and Joseph Ritz, Hatboro, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1965, Ser. No. 455,673
Int. Cl.[3] G01S *3/02*
U.S. Cl. 343—456 **10 Claims**



1. In an automatic aircraft carrier landing system having a carrier provided with a radio transmitter for transmitting a predetermined sequence of digital information and a plurality of aircraft each having a radio receiver for receiving said sequence, a data link in each aircraft for translating said sequence into aircraft guidance information comprising:

a shift register connected to said receiver to receive said sequence;

a clock connected to advance said register at the rate of said sequence;

means to read from said register at predetermined intervals portions of said sequence; and

timing means to control the operation of the shift register and reading means;

wherein said means to read comprises:

means at the first of said predetermined intervals to determine by the condition of a portion of said register if the aircraft is being addressed and to issue an address recognize signal thereupon; and

means in response to said signal to determine by the condition of another portion of said register the nature of information in subsequent portions of said sequence.

4,500,886

DATA LINK SHIFT REGISTER OPERATION

Henry Naubereit, Maple Shade, N.J.; Thomas F. Long, Warminster; Salvatore R. Picard, and Joseph Ritz, both of Hatboro, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1965, Ser. No. 455,674
Int. Cl.[3] G01S *3/02*
U.S. Cl. 343—456 **10 Claims**

1. In an automatic aircraft carrier landing system having a carrier provided with a radio transmitter for transmitting a predetermined sequence of digital information and a plurality of aircraft each having a radio receiver for receiving said sequence, a data link in each aircraft for translating said sequence into aircraft guidance information, comprising:

a shift register connected to said receiver to receive said sequence;

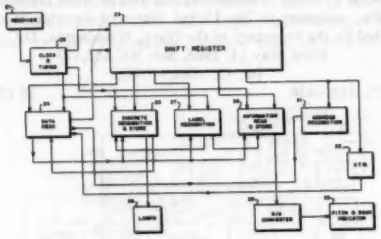
a clock connected to advance said register at the rate of said sequence;

means to read from said register at predetermined intervals portions of said sequence; and

timing means to control the operation of the shift register and reading means;

said shift register comprising:

a plurality of stages each connected to transfer its condition to the next succeeding stage upon occurrence of a pulse from said clock; and



means to reset all of said stages, one of said stages having its output inverted with respect to the next succeeding stage to insert a false set bit into said register when said register is reset.

4,500,887

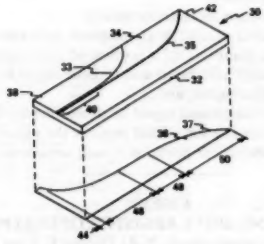
MICROSTRIP NOTCH ANTENNA

William H. Nester, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Sep. 30, 1982, Ser. No. 428,762

Int. Cl.³ H01Q *1/38*

U.S. Cl. 343—700 MS **8 Claims**



1. A notch antenna comprising:

a planar dielectric substrate; and

a two-sided metallization comprising

a first metallization layer disposed on one major surface of said substrate;

a second metallization layer disposed on the major surface of said substrate opposite said first major surface; and

said first and second metallizations being configured to form a two-sided microstrip region at one end of said substrate, a two-sided flared notch antenna region at the opposite end of said substrate, and a continuously two-sided transmission line in a longitudinally center region interconnecting said regions, the longitudinal edges of said first and second metallization layers transitioning smoothly from said microstrip region to said two-sided, flared notch antenna region.

4,500,888

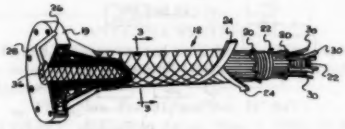
ANTENNA CONSTRUCTION

Don E. Brandigampola, Guelph, Canada, assignor to Valcom Limited, Guelph, Canada

Filed Feb. 25, 1983, Ser. No. 469,946

Int. Cl.³ H01Q *1/40*

U.S. Cl. 343—873 **4 Claims**



1. Free standing antenna for use in severe climatic conditions, such antenna being attached at its base, but being otherwise free of attachment or support, and said antenna being formed with an elongated tubular body portion, having one or more sections, and an enlarged base portion at its lower end for mounting thereof, and said body portion comprising;

a plurality of layers of reinforcing filaments, some of said layers of reinforcing filaments comprising bundles of longitudinal filament rovings running lengthwise along such body portion, and others of said layers of reinforcing filaments comprising generally circumferential windings of filament rovings, said layers of reinforcing filaments being bonded together by resin material;

electrically conductive means embedded in said elongated tubular structure, and running generally from end to end thereof, and terminating adjacent said lower end thereof;

a generally annular electrically conductive member, connected to said electrically conductive means, adjacent said lower end of said tubular structure;

a female threaded metallic electrically conductive socket member connected to said annular member, and extending through a wall of said elongated tubular structure for connection of electrical connection means thereto from the exterior thereof;

at least one layer of woven reinforcing filament cloth material extending up the interior of said tubular structure adjacent said lower end, and overlying the interior of said annular member, and,

resin means bonding said layer of woven cloth material to the interior of said tubular structure, and to the interior of said annular member, thereby substantially embedding and enclosing said annular member.

4,500,889

METHOD FOR RECORDING LIGHT INFORMATION

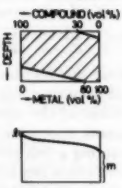
Minoru Wada; Yonosuke Takahashi, and Eiichi Hasegawa, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 21, 1982, Ser. No. 390,735

Claims priority, application Japan, Jun. 19, 1981, 56-93964

Int. Cl.³ G01D *15/34, 15/32*; G03C *5/04, 5/24*

U.S. Cl. 346—1.1 **23 Claims**



1. In a method for recording information by irradiating an

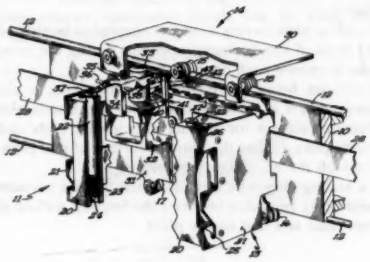
optical information recording material comprising a heat mode recording layer comprising a metal on a base with a light beam, the method for recording optical information in which said heat mode recording layer consists of a metal and at least one metal compound selected from metal oxides and metal sulfides and the proportion of the amount of the metal to that of said metal compound changes in a manner that the proportion either increases or decreases in the direction of the thickness of the layer, said recording layer having a layer comprising a mixture of at least one of the metals and at least one of the metal compounds in which irradiation with the light beam is conducted from the side where the proportion of the metal in the recording layer is smaller, and in which melting and removing are conducted to expose an area where the proportion of the metal is greater in the recording layer until the difference in reflection of the light between the non-irradiated area and the irradiated area reaches an extent which is sufficient to permits reading by light.

4,500,890

GRAPHIC RECORDING SYSTEM

Rodney G. Nicholas, Berkeley, Calif., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Aug. 23, 1982, Ser. No. 410,504
Int. Cl.³ G01D *9/40*
U.S. Cl. 346—29 **20 Claims**



1. In a graphic recording system of the type wherein a plurality of recording elements are moved relative to a recording medium and having means for selectively actuating said recording elements for recording on said medium, the improvement which comprises:

carriage means for carrying said recording elements;

means, including rail means, independently supporting said carriage means and said actuating means for movement relative to said recording medium and each other along said rail means;

means selectively moving at least one of said carriage means and actuating means relative to the other along said rail means for recording element selection; and

means selectively locking said carriage means and said actuating means for movement together by said selectively moving means during recording.

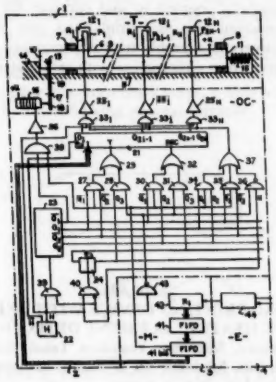
4,500,891

PROCESS FOR PRINTING DOTS ON A HEAT SENSITIVE PAPER BY A THERMAL PRINTER AND PRINTER USING THIS PROCESS

Bernard Gimel, and Christian DeFay, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 18, 1983, Ser. No. 458,876
Claims priority, application France, Jan. 29, 1982, 82 01451
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **6 Claims**

1. A process for printing dots on a heat sensitive paper by means of a thermal printer comprising a printing head formed by N heating resistors, aligned in the direction of the line to be printed, signal input devices representing the dots to be printed, means for storing the signals received by the input devices, as well as means for controlling the displacement of the printing head and the heating of the resistors corresponding to the location of the dots to be printed, wherein in a first stage heating takes place of the resistors corresponding to the locations of the dots to be printed in a line directly facing these resistors and in a second stage the printing head is displaced in order to again heat the resistors on the head corresponding to



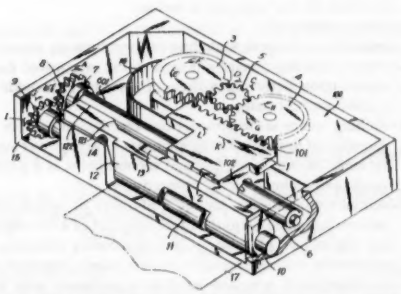
the locations of the dots of the line still to be printed, and wherein the displacement of the printing head is prevented and the heating of the resistors corresponding to the dots remaining to be printed is permitted during the second stage when, the number of dots to be printed, stored in the storage means, exceeds a predetermined number of dots, in order to ensure that the number of dots to be stored does not exceed the storage capacity of the storage means.

4,500,892

SERIAL THERMAL PRINTER

Seiichi Hirano, Shiojiri, Japan, assignor to Epson Corporation, Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 515,087
Claims priority, application Japan, Jul. 21, 1982, 57-128008
Int. Cl.³ B41J *3/20*
U.S. Cl. 346—76 PH **20 Claims**



1. A serial thermal printer for printing on a thermo-sensitive recording medium comprising a frame, a carriage supported on said frame for lateral movement across said recording medium, a thermal print head supported on said carriage for lateral displacement therewith for printing on said recording medium, platen means supported on said frame for supporting said

recording medium so that said print head can be pressed against said recording medium to effect thermal printing thereon, motor means having a relatively flat configuration supported on said frame and having a vertical rotatable shaft which is rotated by said motor means, drive gear means operatively coupled to said rotatable shaft for selective rotation thereby in opposite directions in response to rotation by said motor means, converting means for converting rotation of said drive means into lateral movement of said carriage, paper feed means operatively coupled to said carriage for feeding said recording medium past said print head, and platen release means selectively engageable with said carriage for releasing said print head from engagement with said platen means.

4,500,893

THERMAL-PRINTING DEVICE WITH DEFECTIVE RESISTIVE HEATING ELEMENT DETECTION MODE

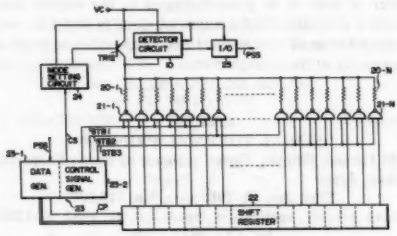
Yasuhiro Sakura, Mishima; Yoshihiro Takai, Shizuoka, and Michio Suzuki, Mishima, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,552

Claims priority, application Japan, Apr. 28, 1983, 58-75949

Int. Cl.³ G01D *15/10;* **H05B** *1/02, 1/00;* **B41J** *3/20*

U.S. Cl. 346—76 PH **20 Claims**



1. A thermal-printing device comprising:

a power supply terminal set at a predetermined potential;

a pluraltiy of heat generating means;

a first current path;

a second current path including current limiting means;

current detecting means for generating a control output signal upon detecting a flow of a current through said second current path;

switching means set to connect one terminal of each of said plurality of heat generating elements to said power supply terminal through said first and second paths in a printing mode and a check mode, respectively; and

potential setting means, having a plurality of output terminals each connected to the other terminal of a corresponding one of said plurality of heat generating elements, for selectively setting potentials at said output terminals at a predetermined potential level in accordance with input data to selectively flow a current through said plurality of heat generating elements in the printing mode, and for sequentially setting the potentials at said output terminals at said predetermined potential level to sequentially flow a check current through said plurality of heat generating elements in the check mode.

4,500,894

DEVICE FOR COVERING AND CLEANING THE DISCHARGE OPENINGS OF INK PRINTING HEADS

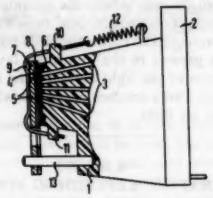
Wilhelm Kirner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 16, 1983, Ser. No. 466,890

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3207072

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **5 Claims**



1. A device for sealing and cleaning the discharge openings of a nozzle plate having plural discharge openings in an ink printing head, including in combination:

a sealing plate mounted for movement relative to the nozzle plate;

said sealing plate having a cut-out adapted to be aligned with the front of the discharge openings during the print periods, to release such openings;

said cut-out being sharp-edged for executing a cleaning function as it is moved relatively to said nozzle plate;

a pressure element for forcing said sealing plate and said nozzle plate against the limiting surface of said print head at which the ink channels terminate;

and a sealing ring which is deformed by said pressure element being provided between the limiting surface of said print head and said nozzle plate.

4,500,895

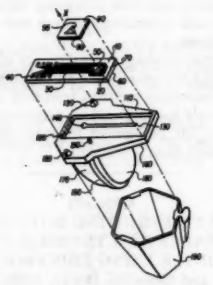
DISPOSABLE INK JET HEAD

Roy T. Buck; Frank L. Cloutier; R. Ernst Erni; Robert N. Low, all of Corvallis, Oreg., and F. Duncan Terry, Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 2, 1983, Ser. No. 490,754

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **10 Claims**



1. A printing apparatus for jetting ink in an ink jet printer comprising:

a collapsible ink reservoir;

a substrate having jetting means disposed on the substrate for imparting momentum to the ink, and electrical connection means for energizing the jetting means;

orifice means connected to the substrate and covering the

jetting means for providing an orifice through which the ink is jetted under the influence of the momentum imparted by the jetting means;

support means coupled to and mechanically supporting the ink reservoir and the substrate for providing a sealed hydraulic connection therebetween for the ink;

fill means coupled to the ink reservoir for substantially filling the collapsible ink reservoir with ink; and

plug means coupled to the fill means for hydraulically sealing the fill means so that the only exit for the ink from the ink reservoir is through the orifice means.

4,500,896

HEAT-SENSITIVE RECORDING MEDIUM AFFORDING PATTERNS WITH DIFFERENT COLORS

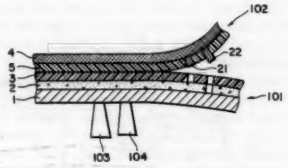
Keishi Kubo, Yokohama; Hideo Watanabe, Numazu; Nobuhiro Takigawa, Numazu; Minoru Hagiri, Numazu, and Kanjiro Kawasaki, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,357

Claims priority, application Japan, Jan. 25, 1983, 58-10388; Mar. 12, 1983, 58-40960

Int. Cl.³ B41M *5/22*

U.S. Cl. 346—204 **16 Claims**



1. A heat-sensitive recording medium comprising:

(a) a transferring sheet which includes

a first substrate,

a lower layer provided over said first substrate and comprised of a discoloring agent and a solid ink having a first color, and

an upper layer provided above said lower layer and containing a leuco-compound capable of coloring in a second color which is different from said first color by reaction with a developer at such a first temperature that at least one of said leuco-compound and said developer can melt but that neither said discoloring agent nor said solid ink can melt, said leuco-compound being incapable of coloring upon contact with said developer in the presence of said discoloring agent at such a second temperature that both of said discoloring agent and said solid ink can melt; and

(b) a receiving sheet which includes

a second substrate, and

a developing layer provided over said second substrate and containing said developer,

whereby, when said recording medium is subjected to thermal recording temperatures with said upper layer being maintained in thermal contact with said developing layer, there are formed a first image developed by the contact between said leuco-compound and said developer at said first temperature and a second, fused image of said solid ink at said second temperature, said first and second images being received by said receiving sheet.

4,500,897

HEAT-SENSITIVE BLACK RECORDING ELEMENT

Masanori Matsuda, Sakai; Haruo Koyama, Hirakata, and Nobuhiro Miyakawa, Abiko, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

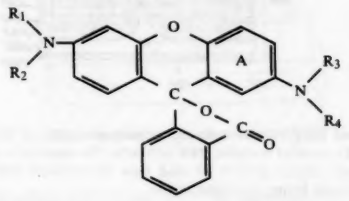
Filed Jun. 29, 1983, Ser. No. 509,067

Claims priority, application Japan, Jun. 29, 1982, 57-110676

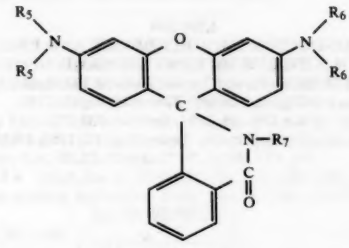
Int. Cl.³ B41M *5/18, 5/22*

U.S. Cl. 346—209 **15 Claims**

1. A heat-sensitive recording element capable of forming an image of a hue close to a pure black at a low density, which comprises a dispersion of a leuco dye, a heat-fusible organic acidic substance solid at normal temperature and a sensitizing agent in a binder, wherein the leuco dye comprises a fluoran type leuco dye for forming a black color, which is a compound represented by the following general formula:



wherein R_1 and R_2 each represent an alkyl or aryl group having up to 4 carbon atoms or R_1 and R_2 are bonded to form a nitrogen-containing heterocyclic ring group together with the nitrogen atom, R_3 represents a hydrogen atom or a lower alkyl or aralkyl group, R_4 represents an unsubstituted or substituted aryl group, and the ring A may be substituted with a halogen atom or an alkyl group, and a rhodamine lactam type leuco dye for forming a red dye, which is a compound represented by the following general formula:



wherein R_5 and R_6 each represent an alkyl group having up to 4 carbon atoms, and R_7 represents a substituted or unsubstituted aryl group or an aralkyl group, in an amount of 1.5 to 30% by weight based on said black color-forming leuco dye.

4,500,898

SEMICONDUCTOR DEVICES UTILIZING EUTECTIC MASKS

Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,761

Int. Cl.³ H01L *29/78*

U.S. Cl. 357—23 **6 Claims**

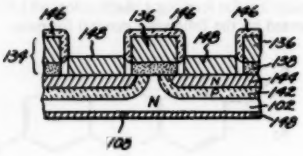
1. A vertical power MOSFET semiconductor device which comprises

(a) a substrate suitable for the manufacture of semiconductor devices, said substrate including at least a planar base of a semiconductor material and a planar layer of a dielectric and insulating material, said base having substantially parallel upper and lower major planar surfaces and a

peripheral edge area interconnecting said major surfaces, said planar layer of a dielectric and insulating material being situated on and contiguous with defined portions of said upper major planar surface of said base designated as an array;

(b) a thin film lamellar metallic eutectic on said defined portions of said planar layer of a dielectric and insulating material;

(c) one of the phases of said thin film lamellar metallic eutectic forming said array of spaced metallic elements with substantially parallel spaces in-between said spaced metallic elements of said array; said elements of said array being less than one micron in width;



(d) said parallel elements comprising an array of substantially parallel metallic gate contacts, the segments of said upper major surface of said base in-between said gate contacts being provided with:

(e) first extended doped regions and second extended doped source regions, said extended doped regions underlying and extending between at least a portion of said gate contacts on either side of each said segment of said upper major surface of said base, each said second extended doped region being substantially bounded by said upper major surface of said base and by a first extended doped region;

(f) source contacts at said source regions; and

(g) at least one drain contact on said lower major planar surface of said body.

4,500,899

SEMICONDUCTOR MEMORY DEVICE AND PROCESS FOR PRODUCING THE SAME

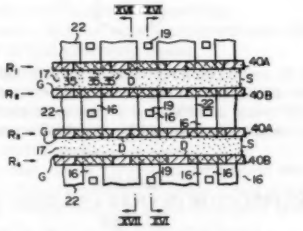
Kazunari Shirai, and Izumi Tanaka, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1981, Ser. No. 333,652

Claims priority, application Japan, Dec. 25, 1980, 55-184715

Int. Cl.³ H01L *29/78, 27/02, 27/10*

U.S. Cl. 357—23 **4 Claims**



1. In a semiconductor memory device, comprising:

a semiconductor substrate;

MOS transistors for use as memory cells formed in said semiconductor substrate and arranged in a plurality of rows;

a plurality of field insulation films arranged in an island pattern formed on said semiconductor substrate, aligned in rows, isolating said MOS transistors from each other and each having an end;

common gates of respective said MOS transistors running in the direction of the rows and said common gates formed on and extending on one row of said field insulation films and having an edge;

a common first region for forming a source or a drain of said MOS transistors running in the direction of the rows and said common first region being parallel to said common gates; and

second regions each for forming another source or drain of each MOS transistor, surrounded by both a pair of said common gates and a pair of said field insulation films that are arranged in an island pattern and each of said second regions being isolated from each other; and

the end of said field insulation films facing said common first region and coinciding with the edge of said common gate extending on said field insulation films and also facing said common first region.

4,500,900

EMITTER BALLAST RESISTOR CONFIGURATION

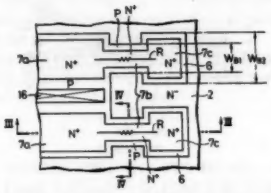
Isao Shimizu, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1982, Ser. No. 350,873

Claims priority, application Japan, Feb. 20, 1981, 56/23017

Int. Cl.³ H01L *29/72, 27/02, 29/06*

U.S. Cl. 357—36 **13 Claims**



5. In a semiconductor device which has a first semiconductor region of a first conductivity type extending from a principal surface into a semiconductor body, a second semiconductor region of a second conductivity type selectively formed within said first semiconductor region to be surrounded by the first semiconductor region, and a third semiconductor region of the first conductivity type selectively formed within said second semiconductor region to be surrounded by the second semiconductor region as a collector region, a base region and an emitter region, respectively for said semiconductor device,

said semiconductor device characterized in that said third semiconductor region includes a pair of transistor operation portions separated from one another by a portion of said second semiconductor region, a pair of ballast resistance portions respectively coupled to said pair of transistor operation portions, said pair of ballast resistance portions being separated from one another by a portion of said second semiconductor region, and a common electrode connection portion coupled to said pair of ballast resistance portions, wherein a part of said first semiconductor region extends to said one principal surface of said semiconductor body between said ballast resistance portions so that the combined lateral width of said second semiconductor region surrounding said pair of ballast resistance portions is less than the total lateral width of said second semiconductor region surrounding said common electrode connection portion.

4,500,901

THYRISTOR HAVING N+- MAIN AND AUXILIARY EMITTERS AND A P+ RING FORMING A P+N+ JUNCTION WITH THE MAIN EMITTER

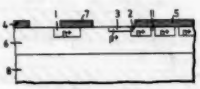
Karl H. Sommer, Belecke; Alois Sonntag, Mulheim, and Wolfgang Pikorz, Belecke, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

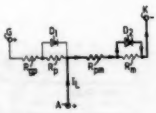
Continuation of Ser. No. 54,894, Jul. 5, 1979, abandoned. This application Jun. 25, 1981, Ser. No. 277,322

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830735

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **14 Claims**





1. In a thyristor with an amplifying gate including: a silicon semiconductor body having three layer-like zones of alternating conductivity type between its two major surfaces with the control base zone on the cathode side of the device being p conductive, and having n^+ conductive main emitter and auxiliary emitter zones formed in said p conductive control base zone adjacent one major surface of said semiconductor body, said auxiliary emitter zone forming only a pn^+ junction with said p conductive control base zone; a metal control contact, a metal auxiliary emitter contact and a metal main cathode contact provided on said one major surface for said p conductive control base zone, said auxiliary emitter zone and said main emitter zone, respectively, said auxiliary emitter contact extending over and contacting a portion of the surface of said p conductive control base zone between said auxiliary and main emitter zones; and a metal anode contact provided on the opposite of said two major surfaces; the improvement comprising means for ensuring firing of the auxiliary thyristor before the main thyristor by a biasing voltage applied between said anode and said main cathode contacts and a control voltage applied to said control contact, said means including a p^+ zone formed between said auxiliary emitter and said main emitter zones in a region of said p conductive control base zone adjacent said one major surface of said semiconductor body, said p^+ zone contacting the edge region of said main emitter zone which faces said auxiliary emitter zone and forming a p^+n^+ junction with said main emitter zone, and said p^+ zone being laterally spaced from and not physically contacting said n^+ auxiliary emitter zone.

4,500,902

FET CONTROLLED THYRISTOR

Helmut Herberg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 4, 1982, Ser. No. 345,594

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112942

Int. Cl.³ H01L *29/74, 29/78, 27/02, 29/167*

U.S. Cl. 357—38 **18 Claims**

1. In a thyristor of the type having a semiconductor body in which a first base of a first conductivity type has a first emitter of a second conductivity type on one side thereof and a second base of the second conductivity type on the other side thereof, and in which a second emitter of the first conductivity type is provided adjacent the second base on the side opposite the first base, the improvement therein comprising:

a third emitter of the second conductivity type adjacent and spaced from the first emitter; and

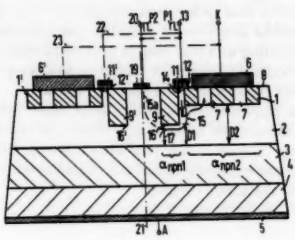
a semiconductor switch bridging and operable to conductively connect said third and first emitters,

said semiconductor switch comprising a field effect transistor including a first edge region of said third emitter, a second edge region of the first emitter, a third region of the first base between the first and third emitters,

a gate spanning said third region and said first and second edge regions and insulated from the semiconductor body, and a control voltage terminal carried by said gate;

said third emitter extending towards and spaced from the junction of the first and second bases a distance less than that of the first emitter;

the first and second bases and the first emitter forming a three-layer structure having a second current transfer ratio which is less than the first current transfer ratio given a forward bias of the second emitter with respect to the first emitter because of the greater recombination rate of carriers of the first emitter due to its greater distance from the junction of the first and second bases.



4,500,903

SEMICONDUCTOR GTO SWITCHING DEVICE WITH RADIALLY ELONGATED CATHODE EMITTER REGIONS OF INCREASING LENGTH

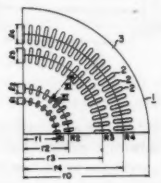
Tsutomu Yatsuo; Takahiro Nagano; Saburo Oikawa, all of Hitachi, and Akira Horie, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

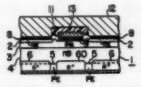
Filed Jun. 3, 1982, Ser. No. 384,520

Claims priority, application Japan, Jun. 5, 1981, 56-85760

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **11 Claims**





1. A semiconductor switching device comprising:

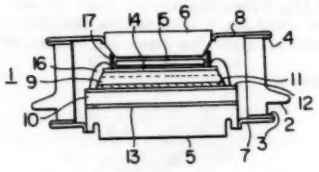
(a) a semiconductor substrate including a cathode-emitter layer, a cathode-base layer, an anode-base layer and an anode-emitter layer, said layers having conductivity types differing alternately from one another between the adjacent layers;
(b) said cathode-emitter layer being divided into a plurality of strip-like cathode-emitter regions which are arrayed on a major surface of said semiconductor substrate in a coaxial multi-ring pattern, each cathode-emitter region being elongated along the radial direction of the ring;
(c) the strip-like cathode-emitter regions which constitute an inner ring in said coaxial multi-ring pattern having a length in said radial direction shorter than the length in the radial direction of strip-like cathode-emitter regions constituting an outer ring in said multi-ring pattern;
(d) cathode electrodes contacted to said strip-like cathode emitter regions in low resistance contact;
(e) gate electrodes disposed so as to enclose said strip-like cathode-emitter regions and contacted to said cathode-emitter regions in low resistance contact; and
(f) an anode electrode contacted to said anode-emitter layer in low resistance contact.

4,500,904

SEMICONDUCTOR DEVICE

Jin Onuki; Ko Soeno; Keiichi Morita, and Hisakithi Onodera, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 211,121, Nov. 28, 1980, abandoned.
This application Oct. 20, 1983, Ser. No. 544,119
Claims priority, application Japan, Nov. 30, 1979, 54-154450
Int. Cl.³ H01L *23/48*
U.S. Cl. 357—67 **15 Claims**



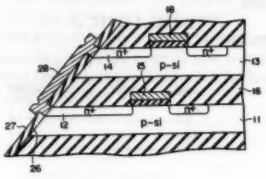
1. A semiconductor device comprising:
a semiconductor substrate including at least one pn junction, an n-type semiconductor layer being exposed to a principal surface of said semiconductor substrate; and
an electrode bonded to the principal surface of said semiconductor substrate with brazing solder,
wherein said brazing solder is in contact with substantially the entire exposed principal surface of said semiconductor substrate to bond said entire exposed principal surface of said semiconductor substrate to said electrode and comprises aluminum solder and copper solder bonded in solid phase adhesion to each other, said aluminum solder containing aluminum as a main component thereof and being provided on the side of said semiconductor substrate, said copper solder being provided on the side of said electrode.

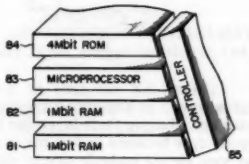
4,500,905

STACKED SEMICONDUCTOR DEVICE WITH SLOPING SIDES

Tadashi Shibata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 28, 1982, Ser. No. 425,513
Claims priority, application Japan, Sep. 30, 1981, 56-155126; Sep. 30, 1981, 56-155127
Int. Cl.³ H01L *23/48*
U.S. Cl. 357—68 **3 Claims**





1. A stacked semiconductor device comprising:
a plurality of semiconductor layers each having integrated circuits stacked with an insulating layer interposed between two adjacent of said semiconductor layers, and
which has at least one inclined face defined by the sloping sides of two or more of said semiconductor layers and one or more of said insulating layers interposed therebetween,
said inclined face being formed thereon through another insulating layer, with at least one element for effecting the transmission and reception of signals between said integrated circuits formed in the different semiconductor layers,
said element being one member selected from the group consisting of an interconnection layer, a semiconductor element and a controller for the respective integrated circuits of said semiconductor layers.

4,500,906

MULTILEVEL MASTERSLICE LSI WITH SECOND METAL LEVEL PROGRAMMING

Kenichi Ohno, Tokyo; Tohru Hosomizu, Yokohama, and Rokutaro Ogawa, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

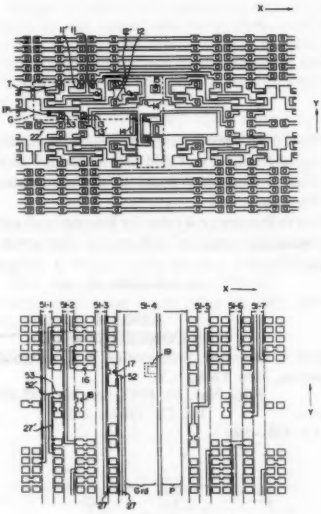
Continuation of Ser. No. 150,799, May 19, 1980, abandoned.
This application May 14, 1982, Ser. No. 378,046
Claims priority, application Japan, May 24, 1979, 54-63203; May 25, 1979, 54-63965
Int. Cl.³ H01L *23/48*
U.S. Cl. 357—71 **5 Claims**

1. A selected masterslice semiconductor LSI device having different types of logic circuits selectively interconnected, said LSI device having been produced from a common structure, said common structure comprising
a semiconductor bulk having at least one group of regions of a respective predetermined configuration repeatedly formed therein, said groups of regions being spaced in said semiconductor bulk to define an array in a first direction and a transverse direction along the surface of said semi-

conductor bulk, each said group of regions corresponding to a basic cell of a respective type,

a first insulating layer formed on said semiconductor bulk with a common pattern of first windows over the basic cells of the same respective type for exposing the respective regions of each type of basic cell,

first interconnecting lines selectively formed over said first insulating layer and in said windows, with a common pattern for the basic cells of the same respective type, said first interconnecting lines for each said basic cell including: (a) first portions each having a first end connected to a corresponding one of said regions and a second end located on said first insulating layer; and (b) second portions each extending in said first direction on said first insulating layer, said second portions at each said basic cell being divided into two respective groupings with each said grouping of second portions being located at a respective side of the regions of the respective basic cell, each said second portion of each said basic cell comprising plural separated parts aligned in said first direction with each said separated part extending along said first direction and having two ends located adjacent to a corresponding end of an adjacent one of said separated parts, said second ends of said first portions and said ends of said separated parts of said second portions being arranged in a common alignment in said transverse direction; and



a second insulating layer formed over said first insulating layer and said first interconnecting lines with a common pattern of second windows formed over said second ends of said first portions and over both said ends of each said separated part of said second portions of said first interconnecting lines, said pattern of second windows having a respective common pattern for the basic cells of each said type, the second windows for both ends of each said separated part of said second portions of said first interconnecting lines being aligned in a row extending in said first direction across said semiconductor bulk, with greater separation along said first direction between adjacent second windows that are over the two ends of the same separated parts than the separation between said second windows over adjacent ends of adjacent ones of said separated parts, said second windows over said ends of said separated parts of said second portions and over a plurality of said second ends of said first portions being aligned in columns extending in said transverse direction across said semiconductor bulk, wherein line areas extending in said transverse direction are formed between said columns of second windows in said second insulating layer, and

said selected LSI device comprising a layer out of which second interconnecting lines selectively are formed on said common structure to selectively connect to the first interconnecting lines through correspondingly selected ones of said second windows in said second insulating layer, said layer of second interconnecting lines comprising, at selected ones of said basic cells, to provide said interconnected logic circuits of different types: (a) lines extending in said transverse direction within said line areas and connecting through selected second windows of said columns of second windows on at least one side of the respective line area; and (b) portions outside of said line areas connecting between adjacent second windows in each said column and between adjacent second windows in adjacent ones of said columns of second windows not separated by said line areas,

wherein said interconnected logic circuits of said LSI device are effectively provided as a result of said common structure and said layer of second interconnecting lines.

4,500,907

PRESSURE-APPLIED TYPE SEMICONDUCTOR DEVICE

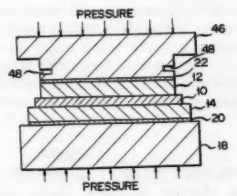
Katsuhiko Takigami, Yokohama, and Keiko Tokushuku, Ibaraki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 17, 1982, Ser. No. 419,477

Claims priority, application Japan, Oct. 23, 1981, 56/169890

Int. Cl.³ H01L *21/603, 23/04, 23/10*

U.S. Cl. 357—79 **6 Claims**



1. A pressure-applied type semiconductor device comprising:

a semiconductor body;

a first metal plate provided on one side of said semiconductor body and having a peripheral surface and a coefficient of thermal expansion similar to the coefficient of thermal expansion of said body; coefficient of thermal expansion of said body;

a first metal stamp for urging said semiconductor body via said first metal plate and having at least one groove formed in its peripheral surface and extending in the circumferential direction thereof, said groove having a bottom inwardly positioned from the peripheral surface of said first metal plate;

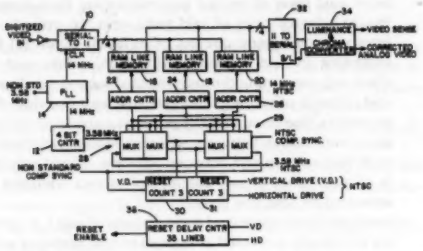
a second metal plate provided on the other side of said semiconductor body and having a coefficient of thermal expansion similar to the coefficient of thermal expansion of said body; and

a second metal stamp for urging said semiconductor body via said second metal plate.

4,500,908
METHOD AND APPARATUS FOR STANDARDIZING NONSTANDARD VIDEO SIGNALS

Richard D. Mandeberg, Chicago, Ill., assignor to Research and Development Institute for Infosystems, Inc., Libertyville, Ill.

Filed Jun. 18, 1982, Ser. No. 389,689
Int. Cl.³ H04N 9/42
U.S. Cl. 358—11 **18 Claims**



1. A method of correcting color video signals represented in digital form having a horizontal scan frequency which is an even harmonic of the color subcarrier to an N.T.S.C. interlaced color video signal having N.T.S.C. luminance and chrominance components and being compatible with and superimposable on other N.T.S.C. color video signals comprising the steps of:

(a) writing the digitized signals into at least one line memory at selected memory locations;

(b) means for resetting the source of the video signals to be corrected once during each N.T.S.C. vertical field to synchronize said source to the N.T.S.C. vertical frame rate;

(c) reading out the digitized video signals from selected memory locations in said line memories at a clock rate synchronized with an N.T.S.C. source;

(d) extracting luminance and chrominance information from the read out signals including the step of shifting the signal sampling window every other horizontal line for either the chrominance or luminance information;

(e) combining the information extracted in step (d) to obtain corrected, analog color video signals.

4,500,909
SYNCHRONIZING SIGNAL GENERATING APPARATUS

Toyotaka Machida, Kashiwa, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Jan. 14, 1983, Ser. No. 457,949
Claims priority, application Japan, Jan. 21, 1982, 57-7974; Feb. 10, 1982, 57-19971
Int. Cl.³ H04N 5/06
U.S. Cl. 358—17 **6 Claims**

1. A synchronizing signal generating apparatus for generating a signal having a chrominance subcarrier frequency, a horizontal synchronizing signal, and other synchronizing signals of a desired color television system, said synchronizing signal generating apparatus comprising:

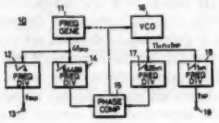
a first frequency generator for at least generating a frequency which is 4c times the chrominance subcarrier frequency of B, G, H, and I/PAL systems, where c is a factor of (625×n) and n is an arbitrary positive integer;

a second frequency generator for generating a frequency which is (11×n) times a horizontal scanning frequency;

a first frequency divider for frequency-dividing an output signal frequency of said first frequency generator by 1/64489;

a second frequency divider for frequency-dividing an output signal frequency of said second frequency generator by 1/(625×n);

a phase comparator for comparing phases of output signals of said first and second frequency dividers, and supplying a phas error signal in accordance with the compared result to said first frequency generator or said second frequency generator to variably control the output signal frequency of the first frequency generator or the second frequency generator so that the phase error becomes zero at said phase comparator;



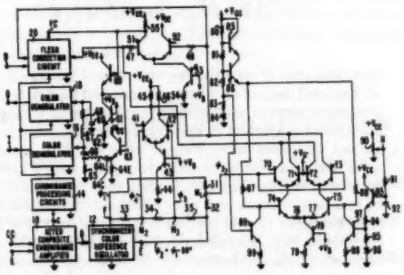
a third frequency divider for frequency-dividing the output signal frequency of said first frequency generator, to produce a frequency equal to the chrominance subcarrier frequency; and

a fourth frequency divider for frequency-dividing the output signal frequency of said second frequency generator by 1/(11×n).

4,500,910
HUE CONTROL SYSTEM

Leopold A. Harwood, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,488
Int. Cl.³ H04N 9/535
U.S. Cl. 358—28 **15 Claims**



9. In apparatus for reproducing color images in response to composite color television signals inclusive of (a) a chrominance signal comprising modulated color subcarrier waves and (b) an accompanying color synchronizing component comprising bursts of oscillations of color subcarrier frequency; said apparatus including (1) a color reference oscillator subject to synchronization with said bursts, and providing first and second oscillatory signals of color subcarrier frequency and respective first and second phases in substantially quadrature phase relationship; (2) first and second synchronous detectors,

each having a modulated signal input terminal coupled to receive said modulated color subcarrier waves, and each having a reference signal input terminal; and (3) a phase shift network connected between the respective reference signal input terminals of said detectors; a hue control system for varying the hues of said reproduced color images, comprising:

matrixing means for combining predetermined magnitudes of said first and second oscillatory signals to form a third oscillatory signal having a third phase lying between said first and second phases;

a differential amplifier of substantially fixed gain, having first and second differential inputs, for developing a fourth oscillatory signal having a phase in quadrature with said third phase across an output load, said first input being responsive to an oscillatory signal derived from said oscillator and having a phase leading said third phase, and said second input being responsive to an oscillatory signal derived from said oscillator and having a phase lagging said third phase;

a source of a variable control voltage;

a source of a reference voltage;

controlled amplifier means, responsive to said third oscillatory signal, to said reference voltage, and to said variable control voltage for additionally delivering said third oscillatory signal to said output load only when a difference exists between said variable control voltage and said reference voltage, with a magnitude dependent upon the magnitude of said difference, and with a polarity dependent upon the sense of said difference; and

means for applying the oscillatory signal appearing across said output load to said reference signal input terminal of said first synchronous detector.

4,500,911

NOISE REDUCTION APPARATUS

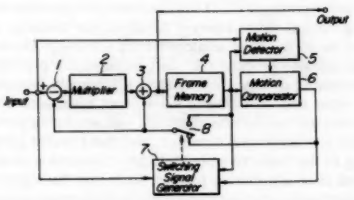
Yuichi Ninomiya, and Yoshimichi Ohtsuka, both of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,268

Claims priority, application Japan, May 25, 1981, 56-77924; May 25, 1981, 56-77925

Int. Cl.³ H04N *5/21*

U.S. Cl. 358—36 **7 Claims**



6. A noise reduction apparatus for reducing noise components in an input picture signal comprising:

a subtractor means for subtracting a predicted picture signal, formed at least by delaying an input picture signal, from said input picture signal to provide an output signal;

a multiplier means for multiplying the output signal of said subtractor means by a factor which does not exceed unity and providing an output signal;

an adder means for adding the output signal of said multiplier means to said predicted picture signal, to obtain an output picture signal of said noise reduction apparatus;

a frame memory means for delaying said output picture signal of said adder means by one frame duration to obtain a non-compensated predicted picture signal output;

a motion detector means for detecting a motion of said input picture signal by comparing said input picture signal with said non-compensated predicted picture signal output;

a motion compensator means for compensating said non-compensated predicted picture signal output in response to said motion detected by said motion detector means to obtain a motion-compensated predicted picture signal output;

a switch means for switching between said non-compensated predicted picture signal output and said motion compensated predicted picture signal output to obtain said predicted picture signal; and

a switching signal generator means for generating a switching signal for controlling said switch means by comparing said non-compensated and said motion-compensated predicted picture signals with said input picture signal.

4,500,912

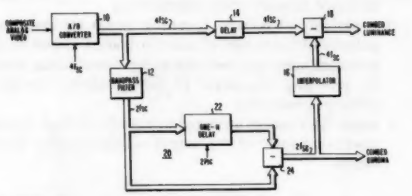
FIR CHROMINANCE BANDPASS SAMPLED DATA FILTER WITH INTERNAL DECIMATION

Thomas V. Bolger, Camden, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1982, Ser. No. 405,172

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—31 **8 Claims**



1. A FIR filter comprising:

a shift register for storing and temporally translating signal, having N serially cascaded delay stages, a signal input terminal coupled to the first delay stage of said series of delay stages and N parallel output terminals located at each stage, said shift register being synchronously clocked to process signals applied to said input terminal at a given rate;

M pairs of first and second signal storage elements;

means responsive to a first clocking signal having a clocking rate less than said given rate for simultaneously coupling signal from respective ones of the register input and output terminals to said first storage elements;

means responsive to a second clocking signal having a clocking rate less than said given rate for simultaneously coupling signal from said respective ones of the register input and output terminals to said second stage elements of said pairs respectively;

M coefficient multiplying circuits for weighting signal applied thereto;

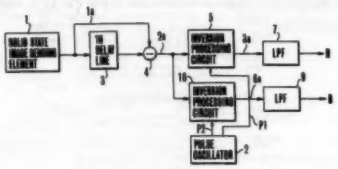
multiplexing means for alternately coupling stored signal from the first storage elements of the M pairs of storage elements to respective ones of said M multiplying circuits to the exclusion of stored signal from said second storage elements, and for coupling stored signal from the second storage elements of said M pairs of storage elements to said M multiplying circuits to the exclusion of stored signal from said first storage elements respectively; and

means for summing the M weighted signals from said M multiplying circuits.

4,500,913
SOLID-STATE COLOR IMAGE SENSING DEVICE

Seiji Hashimoto; Nobuyoshi Tanaka, both of Kanagawa; Akira Suga, Tokyo, and Tetsuro Kuwayama, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,232
Claims priority, application Japan, Jun. 18, 1981, 56-93019
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 17 Claims

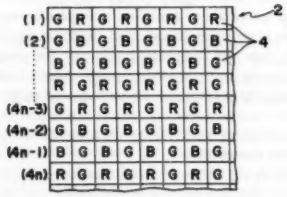


1. A color image sensing device comprising:
a. image pickup means for converting an optical image into an electrical signal;
b. a color separation filter disposed in front of the image pickup means, said filter consisting of a plurality of color filters arranged in a given pattern;
c. a correlation circuit for forming correlative color outputs on the basis of a plurality of different portions of the image pickup means, said correlation circuit being arranged for forming a plurality of color signals each containing predetermined primary color information;
d. a plurality of polarity inverting means for inverting the polarity of the output of said correlation circuit at predetermined intervals, each inverting means being arranged for inverting the output of the correlation circuit at a different phase; and
e. signal filter means arranged to cut off the high frequency zone component of the output of said polarity inverting means.

4,500,914
COLOR IMAGING ARRAY AND COLOR IMAGING DEVICE

Takashi Watanabe, and Shigehiro Miyatake, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 23, 1982, Ser. No. 401,384
Claims priority, application Japan, Aug. 1, 1981, 56-114985[U]; Oct. 20, 1981, 56-156499[U]
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 32 Claims

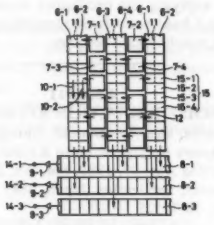


1. A color imaging array comprising:
a plurality of elements including,
first type of elements sensitive to light in a first region of the frequency spectrum,
second type of elements sensitive to light in a second region of the spectrum not coextensive with said first region, and
third type of elements sensitive to light in a third region of the spectrum not coextensive with said first or second regions;
said plurality of elements arranged in a predetermined plane and having a plurality of element sections along both of the horizontal and vertical directions, each section containing two adjacent elements positioned in vertical alignment,
said three types of elements being aligned within said predetermined plane such that said first type of elements occupy both element positions in every other one of said sections in both of the horizontal and vertical directions, said second type of elements occupying one of the two element positions in the remaining sections, and said third type of elements occupy other of the two element positions in the remaining sections.

4,500,915
COLOR SOLID-STATE IMAGER

Norio Koike, Suginami; Toshihisa Tsukada, Nerima; Toru Baji, Kokubunji, and Akira Sasano, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 24, 1982, Ser. No. 423,446
Claims priority, application Japan, Oct. 9, 1981, 56-149492[U]
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 4 Claims



1. A color solid-state imager wherein a group of photoelectric conversion elements for deriving color optical information, and a group of CCD shift registers for successively transferring optical signal charges stored in the elements are integrated on an identical semiconductor substrate; characterized in that sets of vertical CCD shift registers are provided, each set consisting of a pair of registers electrically insulated from each other and on opposite sides of an associated column of photoelectric conversion elements, said sets being periodically arrayed in a horizontal direction, and that transfer gates which belong to the respective photoelectric conversion elements are arrayed in an alternating pattern, such that the signal charges from vertically adjacent photoelectric conversion elements are sent into different ones of the pair of individual vertical CCD shift registers, and that the signal charges of respective colors successively transferred by the vertical CCD shift registers and distributively sent into a plurality of horizontal CCD shift registers which are arranged at ends of the group of vertical CCD shift registers, whereby the signal charges of 1–2 colors are provided from output ends of the respective horizontal CCD shift registers.

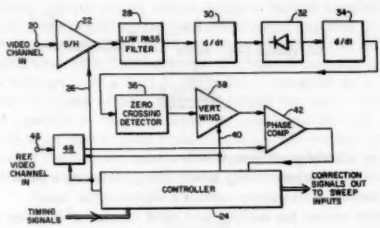
4,500,916
AUTOMATIC ON-AIR REGISTRATION SYSTEM AND METHOD FOR COLOR TV CAMERA

Hazem Nabulsi, Santa Clara, Calif., assignor to Panavision, Inc., Tarzana, Calif.

Filed Apr. 5, 1982, Ser. No. 365,546
Int. Cl.³ H04N 9/09
U.S. Cl. 358—51 23 Claims

1. A method of automatically correcting registration errors in a color television camera that raster scans a scene and pro-

duces video signals representative of different component colors of the scene, comprising sampling first and second component color video signals at a plurality of different points in the raster to detect amplitude level transitions associated with the edges of objects in the scene; comparing corresponding transitions for time coincidence to detect misregistration of the first and second video signals; for each misregistration



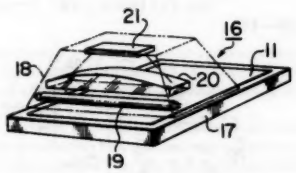
detected, producing an error signal; accumulating separately for each of preselected regions of the raster a plurality of the error signals produced in each region; analyzing the accumulated error signals associated with different regions of the raster to determine the type of registration error present; and, based upon the analysis, generating a correction signal to correct the registration error.

4,500,917

METHOD OF FILING SET-UP DATA FOR A PHOTO-ELECTRIC SCANNER AND AN APPARATUS FOR READING SUCH DATA IN THE FORM OF GRAPHS

Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 17, 1981, Ser. No. 234,654
Claims priority, application Japan, Feb. 27, 1980, 55-23675
Int. Cl.³ H04N *1/04, 3/14*
U.S. Cl. 358—75 **9 Claims**



1. A method of filing set-up data for a photo-electric scanner incorporating a central processing unit having a memory comprising the steps of:

drawing a graph on a sheet of paper on which a coordinate system is defined so that one coordinate X axis corresponds to input data of a memory device while the other coordinate Y axis corresponds to output data stored in said memory device;

mounting said graph on a table having coordinate X and Y axes with the origin of said graph defined as the intersection of said coordinate X and Y axes;

scanning said graph on said table with a linear image sensor having a scanning line that encompasses and is parallel to the Y axis and moves from said origin of the graph along the length of the X axis, the position of said graph being designated at the intersection of said scanning line with respect to the values of X and associates the values of Y as being the intersection of the values of X with said scanning line, said linear image sensor being capable of transmitting X and Y output signals associated with said X and Y axes;

controlling the relative motion between the table and the linear image sensor by way of the central processing unit so that the scanning line is moved from said origin in steps by distances which are directly related to particular X values; and

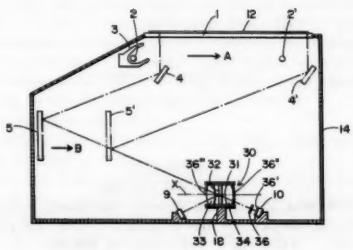
recording in the memory of said central processing unit the Y output signals sent by the linear image sensor at each of the steps in a digital form with the associated X designations of the central processing unit so that a conversion table having characteristics of said graph is recorded in the memory of said control processing unit.

4,500,918

ORIGINAL READING APPARATUS

Noboru Koumura, Narashino; Naoki Ayata, Machida; Seiji Saito, Yokosuka; Hidetoshi Suzuki, and Kunitaka Ozawa, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,632
Claims priority, application Japan, Oct. 19, 1981, 56-165622; Oct. 19, 1981, 56-165623
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **21 Claims**



1. An original reading apparatus including:

original supporting means for supporting an original to be read;

original illuminating means for illuminating the original;

a lens system for forming a plurality of optical images of the original, said lens system having a first lens portion, a second lens portion and a dichroic mirror disposed between said first and said second lens portions and reflecting a light of a first color and transmitting a light of a second color therethrough;

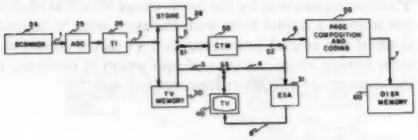
a first image pick-up element for forming an electrical signal corresponding to the image of the original, said first image pick-up element being disposed at a position whereat, of the light from the original, the light of the first color passed through said first lens portion, reflected by said dichroic mirror and again passed through said first lens portion forms the image of the original; and

a second image pick-up element for forming a electrical signal corresponding to the image of the original, said second image pick-up element being disposed at a position whereat, of the light from the original, the light of the second color passed through said first lens portion, said dichroic mirror and said second lens portion in the named order forms the image of the original.

4,500,919
COLOR REPRODUCTION SYSTEM

William F. Schreiber, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 4, 1982, Ser. No. 374,804
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—78 21 Claims



1. A system for reproducing a color original in a medium using a selected multiplicity of reproduction colorants, the system comprising in serial order:

a. a scanner for producing from said color original a set of three tristimulus appearance signals dependent on the colors in said original;

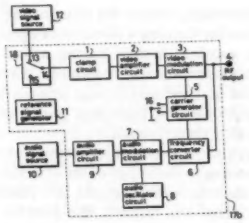
b. display means connected to the scanner for receiving the appearance signals and aesthetic correction circuitry for interactively introducing aesthetically desired alterations into said appearance signals to produce modified appearance signals; and

c. colorant selection mechanism for receiving said modified appearance signals and for selecting corresponding reproduction signals representing values of said reproduction colorants to produce in said medium a colorimetrically-matched reproduction.

4,500,920
RF MODULATOR

Tohru Ohyama, Miyagi, and Shigeru Nigorikawa, Kakuda, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 394,142
Claims priority, application Japan, Jul. 1, 1981, 56-98215[U]
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—139 3 Claims

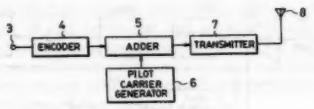


3. In a RF modulator having means including a modulation circuit for modulating a video signal from a video recorder or the like and converting it into a signal for a video monitor, and means including a reference signal generator and a switching circuit for producing a test signal to be delivered on occasion to said monitor, the improvement wherein said modulation circuit, said reference signal generator and said switching circuit are housed in a common shield case.

4,500,921
AGC ARRANGEMENT FOR A TELEVISION SYSTEM

Akimori Tomizawa, and Hiroshi Osaka, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1982, Ser. No. 400,195
Claims priority, application Japan, Jul. 23, 1981, 56-115505
Int. Cl.³ H04N *5/52*
U.S. Cl. 358—174 3 Claims



1. A television system which comprises:

pilot carrier generating means for generating a pilot carrier having a frequency within a video signal band;

adder means for adding said pilot carrier to a video signal which is within said video signal band;

transmitting means for transmitting a TV signal which includes said added video signal and pilot carrier;

means for receiving and demodulating said TV signal and for generating a demodulated signal;

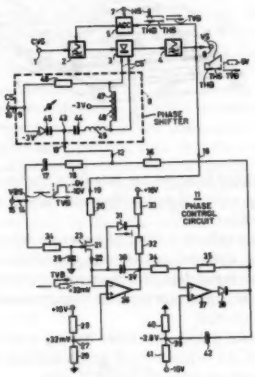
automatic gain control means for extracting said pilot carrier from said demodulated signal to obtain an AGC reference signal for said receiving and demodulating means; and

means for removing said video signal from said demodulated signal and for thereafter supplying said video signal to a later stage.

4,500,922
SYNCHRONOUS DEMODULATION CIRCUIT FOR A CARRIER WHICH IS AMPLITUDE-MODULATED BY A VIDEO SIGNAL

Frederik J. Van Roessel, Upper Saddle River, N.J., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,698
Claims priority, application Netherlands, Dec. 4, 1981, 8105465
Int. Cl.³ H04N *5/44*
U.S. Cl. 358—188 9 Claims



1. A synchronous demodulation circuit for a carrier which is amplitude-modulated by a video signal, the circuit comprising a series arrangement of a high-frequency amplifier and a demodulator, an output of the demodulator, for supplying a demodulated video signal containing a d.c. voltage component, being connected to a control input of the high-frequency amplifier via a keyed automatic gain control circuit, the de-

modulator being connected via a variable phase shifter to a circuit input terminal to which a reference carrier is applied, characterized in that the demodulation circuit further comprises a phase control circuit, having an output connected to a control input of said phase shifter, a first input for receiving a pulse-shaped signal with a pulse in video blanking periods, and a second input coupled to the demodulator output for supplying the demodulated video signal, the first input, for receiving the pulse-shaped signal, being directly coupled to the output of the phase control circuit which output is further coupled to an output of an integrating fed-back differential amplifier incorporated in the phase control circuit, a (+) input of this differential amplifier being connected to a terminal carrying a reference voltage and a (−) input being connected to a signal output of a gate circuit, this gate circuit having a switching input coupled to the first input for receiving the said pulse-shaped signal and a signal input coupled to the second input for receiving the demodulated video signal, the gate circuit being conductive during the occurrence of said pulses.

4,500,923

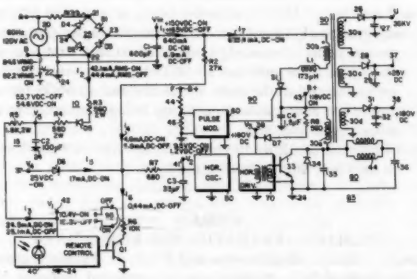
TELEVISION RECEIVER STANDBY POWER SUPPLY

William E. Duvall, and Mau-Choung P. Hwang, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,832

Int. Cl.[3] **H04N** *5/44;* **H01J** *29/70*

U.S. Cl. 358—190 **8 Claims**



1. A power supply for a television receiver responsive to a command signal having an on and off state, comprising:

a source of alternating voltage available during both states of said command signal;

a bridge rectifier including first and second unidirectional current conducting devices, an output terminal, a current return terminal and first and second input terminals, said source of alternating voltage coupled between said first and second input terminals so as to develop a first direct voltage between said output and current return terminals during both the on and the off states of said command signal upon the alternate conduction of said first and second unidirectional current conducting devices;

a first power supply coupled between said bridge rectifier output and current return terminals and responsive to said command signal for developing an operating potential from said first direct voltage only during the on-state of said command signal;

a load circuit energized by said operating potential only during the on-state of said command signal to draw power from said bridge rectifier output terminal;

a control circuit for developing said command signal; and

a standby DC power supply employing one of the bridge rectifier unidirectional current conducting devices to develop a second, lower magnitude, direct voltage that energizes said control circuit during both the on and the off states of said command signal, including a filter circuit having an input terminal and an output terminal, and having a return terminal coupled to the current return terminal of said bridge rectifier, the input terminal of said filter being coupled to said one unidirectional current conducting device for half-wave rectifying said alternating voltage to develop between said filter output and return terminals said second direct voltage of magnitude lower than that of said first direct voltage, said control circuit being coupled between said filter output and return terminals.

4,500,924

SOLID STATE IMAGING APPARATUS

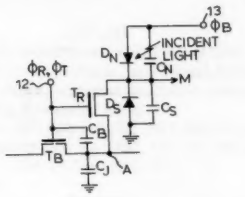
Yoshio Ohta, Amagasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 205,596, Nov. 10, 1980, abandoned. This application Aug. 17, 1982, Ser. No. 408,776

Claims priority, application Japan, Nov. 16, 1979, 54-149375; Nov. 16, 1979, 54-149376; Nov. 16, 1979, 54-149378

Int. Cl.[3] **H04N** *3/14;* **H01L** *27/14, 29/161, 29/78*

U.S. Cl. 358—213 **19 Claims**



1. A solid state imaging apparatus having a substrate and a plurality of cells formed on the substrate, which accumulate charge signals in response to an intensity of an incident light from an object and producing a video signal representing an optical image of the object, by reading the charge signals from said cells, in which each of said cells comprises:

a photosensitive element;

a switching element which is substantially connected to said photosensitive element;

and an electrode which is capacitively coupled to a connection point located between said photosensitive element and said switching element;

said apparatus further comprises a first means for applying a read pulse to said switching element of each of said cells to control said switching element such that the charge signals are read out therefrom; and said apparatus further comprises a second means for supplying a blooming suppression pulse to said electrode of each of said cells in synchronism with said read pulse.

4,500,925

AUTO-FOCUSING SYSTEM FOR VIDEO CAMERA

Kentaro Hanma; Toshio Murakami, and Yoshihiro Todaka, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,643

Claims priority, application Japan, Jun. 26, 1981, 56-98246; Mar. 31, 1982, 57-51250

Int. Cl.[3] **H04N** *5/26*

U.S. Cl. 358—227 **15 Claims**

1. In an auto-focusing system for a video camera comprising:

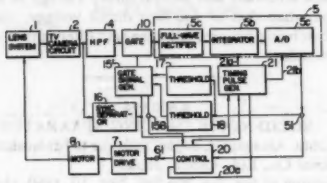
a video camera for providing a video signal;

focus signal extracting means for receiving the video signal from said video camera and for extracted a focus signal representing the degree of matching of focusing and providing an output indicative thereof; and

control means responsive to said focus signal extracting means for controlling the lens system of said video camera so that the output of said focus signal extracting means has a predetermined value, the improvement comprising:

gate means connected between said video camera and said focus signal extracting means; and

gate control signal generating means responsive to at least one of said video camera and said focus signal extracting



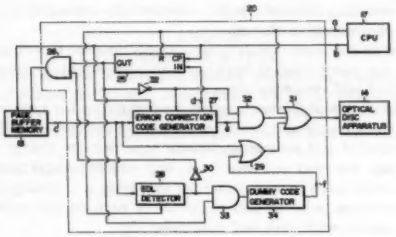
means for generating signals which make said gate means conductive or non-conductive depending on the quantity of high-frequency components included in said video signal.

4,500,926

DATA-RECORDING APPARATUS

Tomohisa Yoshimaru, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 14, 1982, Ser. No. 388,504
Claims priority, application Japan, Jun. 19, 1981, 56-93424
Int. Cl.³ H04N *7/12*
U.S. Cl. 358—256 **9 Claims**



1. A data recording apparatus, comprising:

an optical scanner for optically scanning a document and for outputting an image signal corresponding to a pattern of the document;

means for compressing the image signal from said optical scanner and for converting the image signal into a plurality of image information items each corresponding to at least one scanning line;

means for dividing each of the image information items from said converting means into a plurality of image data pieces of a fixed bit length from an information item end which corresponds to one end of the scanning line;

means for adding dummy data to the image data piece corresponding to the other end of the scanning line to form a terminal end image data piece of the fixed bit length;

means for inserting error correction codes into the image data pieces and the terminal end image data piece; and

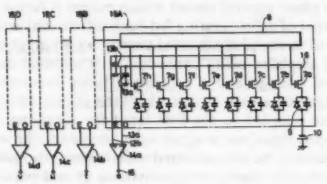
means for recording the image data pieces and the error correction codes on a recording medium.

4,500,927

ORIGINAL READING DEVICE

Takashi Ozawa, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 459,557
Claims priority, application Japan, Jan. 22, 1982, 57-7457
Int. Cl.³ H04N *1/10, 5/21, 1/40, 1/02*
U.S. Cl. 358—293 **4 Claims**



1. An original reading device of the type having light sensing elements connected to a signal line through MOS transistors, whereby a light sensing element is charged when an MOS to which it is connected is turned on, the charging representing light intensity in said light sensing element and being detected on a signal line, the improvement comprising:

first and second signal lines for connection to a block of said elements via a corresponding number of said MOS transistors to which said elements are respectively connected;

said number of MOS transistors being arranged in alternating groups of at least two MOS transistors per group, said groups being alternately connected to said first and second signal lines such that all MOS transistors in any group are connected to the same signal line and all MOS transistors in the next succeeding group being connected to the other signal line; and

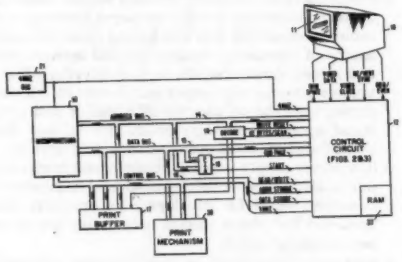
a differential amplifier having its inputs fed with the signals on said first and second signal lines.

4,500,928

STORAGE APPARATUS FOR VIDEO DATA

Francis J. Bucek, Binghamton, and Frank V. Paxhia, Johnson City, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1982, Ser. No. 444,557
Int. Cl.³ H04N *1/22, 1/40*
U.S. Cl. 358—296 **15 Claims**



1. Apparatus for storing video data displayed as a group of scan lines of bit positions generated in response to scan line synchronizing signals and in conjunction with video clock signals comprising:

memory means having data storage locations each for receiving bit position data for said scan line;

means responsive to a said synchronizing signal for temporarily recording the bit position data from a said scan line; and

control means responsive to the accumulation of a predetermined number of said recorded bit position data for storing said recorded data in selected ones of said storage locations of said memory means during the recording of succeeding bit position data in said scan line.

4,500,929

METHOD OF ENGRAVING AN INVISIBLE JOINT WITHIN A GRAVURE PRINTING CYLINDER

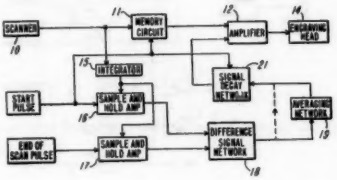
Lester W. Buechler, 3193 Plainfield Rd., Dayton, Ohio 45432

Continuation-in-part of Ser. No. 056,623, Jul. 11, 1979, Pat. No. 4,357,633. This application Aug. 19, 1981, Ser. No. 294,224

The portion of the term of this patent subsequent to May 20, 2001, has been disclaimed.

Int. Cl.³ H04N *1/24*

U.S. Cl. 358—299 **5 Claims**



1. A method of engraving the surface of a gravure printing cylinder with a pattern adapted to be repetitively printed with a joint between adjacent printed patterns being less visible to the human eye, comprising the steps of scanning a copy of a pattern having selected opposite ends adapted to form a joint on the gravure printing cylinder, electronically sensing the copy density at two locations on the pattern copy adjacent the opposite ends, electronically comparing the density at the different locations, electronically determining a correction factor based upon the comparison, engraving generally circumferentially extending rows of peripherally spaced cells within the cylinder surface according to the pattern, and adjusting the depth of the engraved cells corresponding to the opposite ends of the copy according to the correction factor to correct for unbalance in copy density at the two locations on the pattern copy.

4,500,930

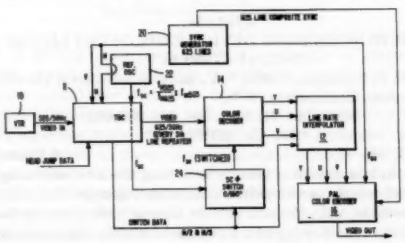
TELEVISION SIGNAL STANDARDS CONVERSION USING A HELICAL SCAN VTR

Kaarlo J. Hamalainen, Marlton, and Glenn A. Reitmeier, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 26, 1982, Ser. No. 382,198

Int. Cl.³ H04N *9/491*

U.S. Cl. 358—310 **2 Claims**



1. A television standards conversion apparatus for changing the line and frame rates of a recorded NTSC television signal to the line and frame rates of a PAL signal standard comprising:

a helical-scan video tape playback apparatus having a capstan which establishes the velocity at which the tape travels and at least one video head disposed on a headwheel which rotates at a velocity to scan the video heads at an angle across the direction of tape travel;

control means for establishing the speed of said capstan in accordance with said NTSC television signal and for establishing the speed of said headwheel in accordance with said PAL signal standard to thereby convert the NTSC frame rate of the recorded television signal to said PAL standard; and

line rate interpolation means for converting the line rate derived from the recorded NTSC television signal to the PAL standard which interpolation means uses coefficients predicated on simple fractional values which have a single digit numerator and a single digit denominator and establish a conversion ratio of 5/6.

4,500,931

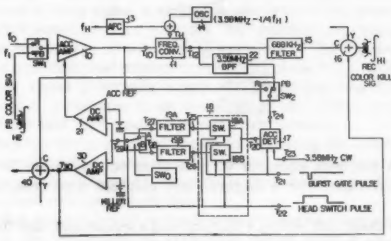
SIGNAL SAMPLING GATE CIRCUIT

Shinichiro Taguchi; Nobuya Nagao, and Yutaka Ogihara, all of Fukaya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 238,024, Feb. 25, 1981, Pat. No. 4,433,255. This application Dec. 12, 1983, Ser. No. 560,159

Int. Cl.³ H04N *9/493*

U.S. Cl. 358—310 **8 Claims**



1. A signal sampling gate circuit in a color video tape recording/reproducing device, having at least two reproducing heads which are alternately switched by a head switch pulse for processing a color signal, comprising:

means (17) for generating a sample signal and processing said color signal;

a sample signal input terminal (T20) to which said sample signal is supplied;

a first hold circuit for holding the sample signal supplied to said sample signal input terminal;

a first sample signal gate circuit for connecting said sample signal input terminal and said first hold circuit, in response to a sampling pulse when in a low impedance state, and disconnecting said sample signal input terminal from said first hold circuit in response to said sampling pulse when in a high impedance state;

a second hold circuit for holding the sample signal supplied to said sample signal input terminal;

a second sample signal gate circuit for connecting said sample signal input terminal and said second hold circuit, in response to the sampling pulse when in a low impedance state, and disconnecting said sample signal input terminal from said second hold circuit when in a high impedance state, said second signal gate circuit functioning in complementary fashion with respect to said first sample signal gate circuit;

gate circuit driving means for selectively and complementarily driving said first and second sample signal gate cir-

cuits in response to the head switch pulse having a different period from that of said sampling rate; and

sample signal gate circuit control means for controlling selectively said first and second sample signal gate circuits in one of the low and high impedance states in response to said head switch pulse;

whereby said sample signal is held in said first and second hold circuits in response to the head switch pulse as a control signal for processing the color signal.

4,500,932

SIGNAL PROCESSING CIRCUIT

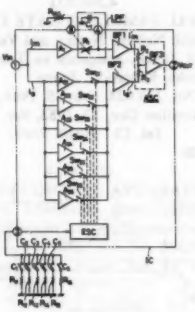
Tetsuo Sato, and Yasuo Kominami, both of Takasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,602

Claims priority, application Japan, Jun. 3, 1981, 56-84343

Int. Cl.³ G11B *5/45, 5/02*

U.S. Cl. 360—65 **10 Claims**



1. A playback equalizer for providing compensation for a playback signal from a magnetic tape playback head comprising:

(a) a main path having a first end and a second end, said first end being supplied with said playback signal;

(b) a side path having a first end and a second end, said first end being supplied with said playback signal;

(c) a low-pass filter disposed between said first end and said second end of said main path, said low-pass filter transmitting a signal which has a first component of flat frequency characteristic below a predetermined first frequency as well as a second component of decreasing frequency characteristic above said predetermined first frequency to said second end;

(d) variable gain means disposed between said first end and said second end of said side path, said variable gain means having a substantially flat frequency characteristic over a predetermined frequency range and the gain which is varied in response to control data; and

(e) an adder coupled to said second ends of said main and side paths, said adder including mans for adding a signal at said second end of said main path and a signal at said second end of said side path and means for transmitting the added signal which has a first component of flat frequency characteristic below said predetermined first frequency, a second component of decreasing frequency characteristic between said predetermined first frequency and a predetermined second frequency and a third component of flat frequency characteristic above said predetermined second frequency to the output terminal, said predetermined second frequency being adjusted by said decreasing frequency characteristic of said low-pass filter and said gain of said variable gain means.

4,500,933

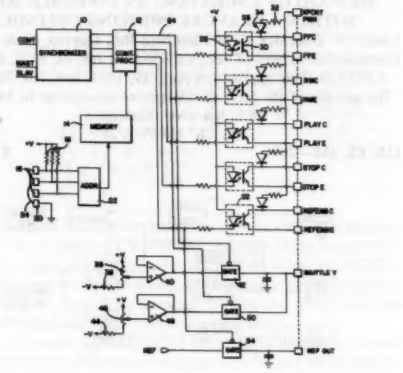
UNIVERSAL INTERFACE UNIT

Steven S. Chan, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,922

Int. Cl.³ H03K *13/24;* G11B *31/00*

U.S. Cl. 360—69 **13 Claims**



1. A universal interface unit for receiving input signals and generating corresponding output signals in one of a number of different formats in dependence upon the requirements of an external device to which the output signals are to be applied, comprising:

means for generating a data signal relating to the signal format requirements of an external device;

a memory unit containing information relating to a plurality of different formats of output signals to be generated and, in response to said data signal, producing output information pertaining to the particular signal format requirements of the external device; and

processing means for receiving the input signals and generating the corresponding output signals in the format indicated by the output information from said memory unit.

4,500,934

HYBRID SWITCHING DEVICE EMPLOYING LIQUID METAL CONTACT

Richard E. Kinsinger, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,602

Int. Cl.³ H01H *9/30*

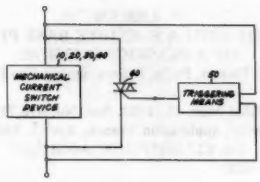
U.S. Cl. 361—3 **6 Claims**

1. A hybrid electrical current switching device comprising:

a mechanical current switch device having open and cloed positions and in which current flow is dependent on the relative positioning of a liquid metal conducting medium; and

a triggerable solid-state current switch device connected in parallel with said mechanical current switch device, so that arc formation across the contacts of said mechanical

current switch device is controllable by triggering of said solid-state current switch device, which is operable to



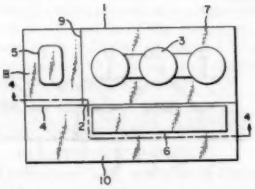
divert current from said switch in response to arc formation conditions.

4,500,935

PACKAGE SUBSTATION IN TANK WITH SEPARATE CHAMBERS

Keiji Tsuruta, Takarazuka, and Nagayuki Tsutsumi, Suita, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 26, 1982, Ser. No. 411,974
Claims priority, application Japan, Sep. 2, 1981, 56-131062[U]
Int. Cl.³ H05K *7/20*; H02B *7/06*
U.S. Cl. 361—333 **1 Claim**



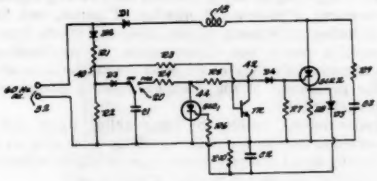
1. A package substation in which a plurality of elements which constitute a substation including a transformer, low tension switchgear and high tension switchgear, are accommodated in a tank, said tank having an outer surrounding wall, separator walls connected to said outer walls and other separator walls to form separate accommodation chambers which isolate said elements each from the others, and insulation fluids filling said accommodation chambers, said insulation fluids covering the elements which are accommodated in said accommodation chambers and said insulation fluids comprising liquids in said high tension switchgear and transformer accommodation chambers and gas in said low tension switchgear accommodation chamber, the liquid containing chambers being isolated and sealed from the gas containing chamber.

4,500,936

FASTENER DRIVING DEVICE HAVING A THREE STAGE FIRING CIRCUIT

Kerry Dulin, Highland Park, Ill., assignor to Textron, Inc., Providence, R.I.

Filed Aug. 9, 1983, Ser. No. 521,570
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—152 **31 Claims**



1. An electrically operated fastener driving device comprising:

a housing assembly defining a drive track;

a driver movably engaged within said drive track;

a magazine for feeding fasteners to said drive track for being driven by said driver;

a solenoid energizable to move said driver through a drive stroke in said drive track;

circuit means, including a first controlled conduction device having a control electrode, for conducting power from an AC potential source to said solenoid to energize it whenever a firing signal is applied to said control electrode;

switch means having a normally "off" position and operable in response to an actuation to move into a "fire" position at a random time relative to the cycles of the AC potential;

firing signal generating means for generating said firing signal in response to an actuation of said switch means from said "off" position to said "fire" position;

firing synchronizer circuit means for inhibiting the coupling of said firing signal to said control electrode until the magnitude of said AC potential is greater than a predetermined reference level; and

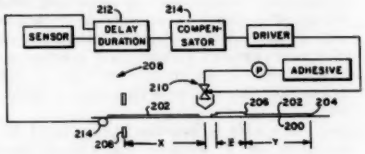
switch bounce circuit means for preventing an interruption in the generation of said firing signal even if switch bounce occurs which might, in the absence of said switch bounce circuit means, cause an interruption of said firing signal.

4,500,937

CONTROL CIRCUIT FOR A SOLENOID DRIVER FOR A DISPENSER

Timothy S. Matt, Bay Village, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Nov. 12, 1982, Ser. No. 441,241
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—153 **7 Claims**



1. A control circuit for a driver for a dispenser having an inherent pull-in delay and drop-out delay, for dispensing fluid for a preselected dispensing duration upon a substrate conveyed by a conveyor commencing at a preselected position, comprising:

encoder means for generating a pulse signal representative of conveyor distance traveled per unit time;

sensor means for sensing the presence of a conveyed substrate at a preselected location and for generating a trigger signal indicating a substrate is at the preselected location;

delay means, enabled through the trigger signal and connected to receive said pulse signal, for generating an enabling signal after a first preselected number of pulses, said delay means including a delay counter enabled through the trigger signal and generating the enabling signal after receiving a preselected number of pulses, and further including accelerator means, receiving inputs from said encoder means and sensor means for accelerating the generation of pulses to said delay counter so as to advance the generation of the enabling signal a predetermined period of time;

duration means, enabled by the enabling signal and connected to receive said pulse signal, for generating an initial driving signal of a preselected signal duration reflective of a second preselected number of pulses; and

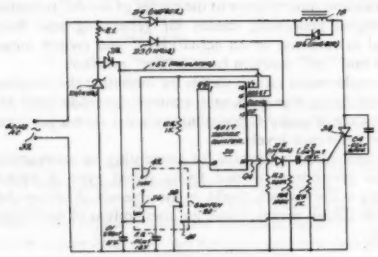
compensator means, receiving the initial driving signal, for modifying the commencement and duration of the initial driving signal to compensate for the dispenser pull-in and drop-out delays to produce a driver signal couplable to a driver so that fluid is deposited for the dispensing duration upon a substrate commencing at the preselected position.

4,500,938

FASTENER DRIVING DEVICE

Kerry Dulin, Highland Park, Ill., assignor to Textron, Inc., Providence, R.I.

Filed Feb. 16, 1983, Ser. No. 467,162
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—153 **32 Claims**



1. An electrically operated fastener driving device comprising:

a housing assembly defining a drive track;

a driver movably engaged within said drive track;

a magazine for feeding fasteners to said drive track for being driven by said driver;

a solenoid energizable to move said driver through a drive stroke in said drive track;

circuit means, including a controlled conduction device having a control electrode, for conducting power from an AC potential source to said solenoid to energize it whenever a firing signal is applied to said control electrode;

switch means having a normally "off" position and operable in response to an actuation to move into a "fire" position at a random time relative to the cycles of the AC potential; and

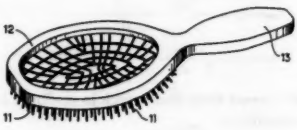
counter means for (a) counting the cycles of AC potential occurring after an actuation of said switch means from its normally "off" position to its "fire" position and (b) applying a firing signal to said control electrode to place said controlled conduction means in a conductive state during a properly poled half cycle of said AC potential occurring a predetermined number of cycles greater than one (1) after the actuation of said switch means, the conductive state of said controlled conductive device causing said solenoid to be energized, and (c) preventing the application of a further signal to said control electrode after the application of said firing signal until said switch means is returned to its "off" position and reactuated to its "fire" position.

4,500,939

HAIR BRUSH WITH A FLEXIBLE BASE PLATE MADE OF A PLASTIC MATERIAL

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Mar. 18, 1983, Ser. No. 476,718
Claims priority, application France, Apr. 7, 1982, 82 06072
Int. Cl.³ H05F *3/00*; A46B *9/08*
U.S. Cl. 361—221 **20 Claims**



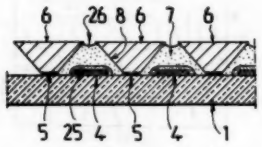
1. In an antistatic hair brush comprising handle means and brushing means carried by said handle means, said brushing means embodying a flexible base means and bristles on said base means, the improvement wherein said base means is made of an antistatic plastic material and includes grid means defining apertures and bristles being integrally moulded together with said grid means and disposed perpendicular to the grid means.

4,500,940

CAPACITIVE HUMIDITY SENSOR AND METHOD FOR THE MANUFACTURE OF SAME

Heikki T. Kuisma; Ari Lehto, both of Helsinki, and Jouko S. Jalava, Vantaa, all of Finland, assignors to Vaisala Oy, Helsinki, Finland

Filed Dec. 19, 1983, Ser. No. 562,746
Claims priority, application Finland, Dec. 21, 1982, 824392
Int. Cl.³ H01G *5/20*
U.S. Cl. 361—286 **6 Claims**



1. Capacitive humidity sensor, which comprises

a substrate made, e.g., of glass,

at least one first and one second bottom electrode arranged close to each other on the substrate,

an active layer, which fills the area between the first and the second bottom electrode on the substrate and extends to above the top face of the second electrode,

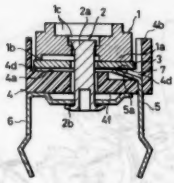
a plurality of conductive, beam-shaped structures placed side by side, connected to the first electrode, and having an upwardly widening cross-section, said structures limiting portions of the active layer between themselves from two sides such that a narrow slot is formed between the top faces of said structures.

4,500,941

CERAMIC TRIMMER CAPACITOR

Hiroshi Izumi, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 341,097
Claims priority, application Japan, Jan. 27, 1981, 56-9905[U]
Int. Cl.³ H01G 5/04
U.S. Cl. 361—293 **3 Claims**



1. A ceramic trimmer capacitor comprising a ceramic board, a substantially semi-circular stator electrode formed on one surface of the ceramic board, a conductive rotor member, and an insulating frame having a surface for supporting said ceramic board; means including a plurality of arcuate portions spaced around said surface of said frame for engaging extreme peripheral portions of said ceramic board for holding said ceramic board between said rotor member and said insulating frame so that the periphery of said ceramic board is supported by said arcuate portions with minimal bending stresses being applied during loading of said rotor member.

4,500,942

TEMPERATURE STABLE MONOLITHIC CAPACITORS AND CERAMIC COMPOSITIONS FOR PRODUCING SAME

James M. Wilson, Victor, N.Y., assignor to Ferro Corporation, Cleveland, Ohio

Filed Nov. 12, 1982, Ser. No. 440,804
Int. Cl.³ H01G 4/12; C04B 35/46
U.S. Cl. 361—320 **11 Claims**

1. A ceramic temperature compensating dielectric composition in fine particle form having a dielectric constant of 84.0 or greater and consisting essentially of a mixture of BaO, PbO, Bi_2O_3, TiO_2 in quantities of approximately 16, 2, 9 and 37 wt. %, respectively, and rare earth oxides in an amount not exceeding approximately 35 wt.% of said mixture, said rare earth oxides consisting essentially of Nd_2O_3 and one of the additional rare earth oxides selected from the group consisting of Pr_6O_{11} and Sm_2O_3, said Nd_2O_3 being present in amounts ranging from approximately 17.4 to 31.3 wt.% of the overall mixture, and said additional rare earth oxide being present in an amount ranging from approximately 10 to 50 wt. % of the total amount of rare earth oxides present in the mixture.

4,500,943

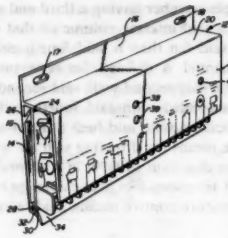
ELECTRONIC PANEL

Ted R. Greene, Livermore, Calif., assignor to United Security Products, Inc., Livermore, Calif.

Filed Dec. 9, 1982, Ser. No. 448,102
Int. Cl.³ H05K 7/20
U.S. Cl. 361—383 **7 Claims**

1. An electronics panel comprising:

a unitary extrusion of substantially constant cross section adapted to be horizontally mounted to a supporting vertical structure, said extrusion including a back plate having a front surface and a back surface adapted to be mounted flush to the supporting structure, a top plate projecting forwardly from the front surface of the back plate at a position spaced downwardly from the top edge of the back plate, a front plate parallel to the back plate and projecting downwardly from the forward edge of the top plate with the lower edge of the front plate spaced upwardly from the lower end of the back plate and being structurally unconnected to the back plate to produce a space between them, said extrusion further having a clip near the juncture of the front surface of the back plate and the bottom surface of the top plate and a snap near the lower edge of the back plate; and



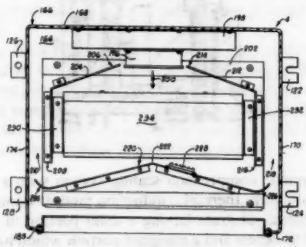
a circuit board having parallel edges, one edge inserted in the clip and the other engaged by the snap to secure the circuit board to the extrusion, said circuit board including a row of connector elements near the edge of the board engaged by the snap so that the connector elements are exposed below the lower edge of the front plate and allow for passage of air upwardly between the front and back plates of the extrusion to cool the circuit board.

4,500,944

ENCLOSURE FOR ELECTRONIC COMPONENTS

Don M. Roberts, and David W. Looper, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 6, 1983, Ser. No. 501,681
Int. Cl.³ H05H 7/20
U.S. Cl. 361—384 **16 Claims**



1. An enclosure for providing a temperature-controlled environment, comprising:

a housing, including:

a first wall;

a second wall connected to said first wall, said first and second walls defining an interior volume therebetween; and

a third wall connected to said second wall in movable relationship thereto and providing a closable entry to said interior volume;

temperature control means for transferring heat to or from said interior volume and including a heat transfer means disposed in said second wall, said heat transfer means having a surface area disposed in said interior volume;

air movement means for moving air within said interior volume, said air movement means including a fan associated with said surface area of said heat transfer means;

first baffle means for directing said air moved by said air movement means to flow in a first direction within said interior volume; said first baffle means including:

a first angle member, having a first end and a second end disposed in said interior volume so that said first end is closer to said fan than is said second end, and so that a first channel is defined between said first angle member and said second wall, said first channel having an inlet associated with said second end and having an outlet associated with said heat transfer means; and

a second angle member having a third end and a fourth end, disposed in said interior volume so that said third end is closer to said fan than is said fourth end, and so that a second channel is defined between said second angle member and said second wall, said second channel having an inlet associated with said fourth end and having an outlet associated with said heat transfer means; and

second baffle means for directing said air which has flowed in said first direction to flow in a second direction from which said air comes into heat exchange relationship with said temperature control means, said second baffle means including:

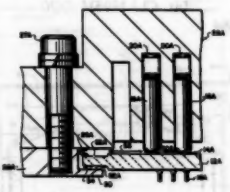
a deflector member extending at least partially across said interior volume in overlapping association with said second and fourth ends so that said air moved by said air movement means is directed into the inlets of said first and second channels.

4,500,945

DIRECTLY SEALED MULTI-CHIP MODULE

Lewis D. Lipschutz, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 23, 1982, Ser. No. 401,186
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—386 **9 Claims**



1. A hermetic compression sealing system with a semiconductor, multi-chip, thermal conduction module comprising:

(a) a ceramic substrate having a main portion of predetermined thickness and a marginal portion which has a thickness less than said predetermined thickness and including interconnected semiconductor chips containing integrated circuits defining said module;

(b) means for directly sealing said module, said means including:

1. a unitary metallic compression seal in direct bearing contact with the marginal portion of the upper surface of said substrate for providing hermetic sealing of a gas charge;

2. a cover in contact with said compression seal;

3. a clamping plate holding the cover, compression seal and the ceramic substrate in sealing engagement, thereby forming a unitary sealed chamber surrounding said module; said clamping plate having a flange in overlapping relationship with the marginal portion of the lower surface of said substrate;

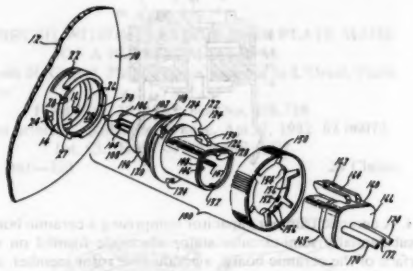
(c) means for conducting heat from the semiconductor chips to the ambient, including a gas charge within said chamber, the means for directly sealing said module preventing leakage of the gas to the ambient.

4,500,946

REPLACEABLE LAMP ASSEMBLY FOR A SEALABLE REFLECTOR HOUSING

James A. Mikola, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 13, 1982, Ser. No. 339,194
Int. Cl.³ H01R *33/00*
U.S. Cl. 362—226 **11 Claims**



1. A replaceable lamp plug assembly for mating with a hermetically sealable lamp enclosure including a light transmitting lens, attached to the front of a light directing reflector and an open cylindrical socket formed to extend outwardly from the rear of said reflector comprising:

a filament lamp light source; and

plug means having a body portion formed to be axially inserted into said cylindrical socket wherein said plug means includes means for permanently supporting said lamp so that the filament of said lamp is located at a predetermined point and in a predetermined orientation with respect to said body portion; means for hermetically sealing said lamp enclosure when said plug means is inserted into the rear of said cylindrical socket; a base flange extending transverse to said body portion and having a diametric dimension larger than that of said cylindrical socket for contacting the outward extension of said cylindrical socket and limiting the insertion distance of said plug means into said socket; a plurality of electrical terminals permanently connected through said body portion to said filament of said lamp; and a plug connector shroud on the opposite end of said plug means from said support means, extending beyond said base flange and surrounding said terminals.

4,500,947

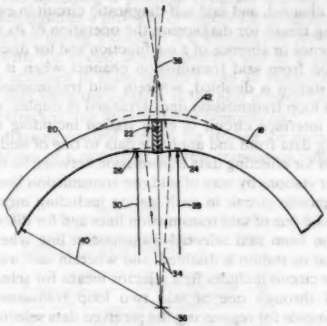
TRI SPHERICAL LENS ASSEMBLY

Frederick M. Perkins, Miami, Fla., assignor to Perko, Inc., Miami, Fla.

Filed Nov. 10, 1982, Ser. No. 440,550
Int. Cl.³ F21V *3/00*
U.S. Cl. 362—311 **18 Claims**

1. A continuous lens assembly with uninterrupted arc of visibility comprising at least a first lens segment and a second lens segment and at least one junction at the edges thereof and consisting of a progressively thicker lens portion of each seg-

ment as said segment nears said junction for progressively imparting a greater degree of refraction in the area of said lens



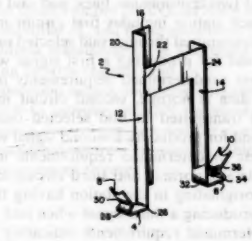
segments adjacent said junction for bending light rays in the direction of said junction.

4,500,948

ONE-PIECE FRAME FOR AN ELECTRIC LAMP

Ronald G. Blaisdell, Saugus, and Peter R. Gagnon, Georgetown, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 7, 1983, Ser. No. 539,852
Int. Cl.³ F21V *21/00*
U.S. Cl. 362—382 **4 Claims**



1. A one-piece frame for mounting a light-source capsule within the outer envelope of an electric lamp comprising:

(a) a one-piece body formed by means of bending a single sheet of stiff electrically conductive material, said one-piece body having two legs and a bridge between said legs, each of said legs being formed to provide means for mounting said frame within said outer envelope, said body being sufficiently rigid to provide support for mounting said light-source capsule thereon, said body having sufficient electrical conductivity to act as a part of an electrical circuit through which electrical power is conveyed to said light-source capsule from an external source.

4,500,949

CHOPPING TYPE ELECTRICAL CONVERTER

Ralph Prete, West Haven, Conn., assignor to Stone Safety Corporation, Wallingford, Conn.

Filed Feb. 14, 1983, Ser. No. 465,839
Int. Cl.³ H02M *3/315*
U.S. Cl. 363—28 **21 Claims**

1. A chopping type electrical converter wherein the chopping frequency is varied to control a DC output voltage, comprising:

(a) a primary circuit for chopping an input voltage comprising:

(i) at least one controlled rectifier, and

(ii) at least one voltage transformer means associated with controlled rectifier and electrically connected thereto;

(b) a secondary circuit comprising:

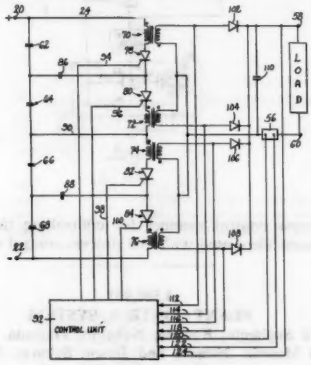
(i) output terminals,

(ii) rectifier means electrically connected to the voltage transforming means, and

(iii) filtering means electrically connected to the output terminals and the rectifier means for providing the DC output voltage; and

(c) a control unit comprising:

(i) a pulse generator for generating trigger pulses at a variable frequency to trigger on the controlled rectifier and thereby chop the input voltage,



(ii) a control circuit including means for sensing the output voltage, and means for controlling the frequency at which the pulse generator generates pulses, responsive to the sensed output voltage, to hold the output voltage at a desired output level over a range of output currents, and

(iii) a backfire prevention circuit including means for sensing the presence of current flowing in the voltage transforming means associated with controlled rectifier, and including means for delaying trigger pulses to controlled rectifer until current has ceased to flow in its associated voltage transforming means.

4,500,950

INDUSTRIAL PROCESS CONTROL APPARATUS AND METHOD

Richard E. Putman, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 12, 1982, Ser. No. 367,830
Int. Cl.³ G05B *13/02*; G06F *15/46*
U.S. Cl. 364—138 **8 Claims**

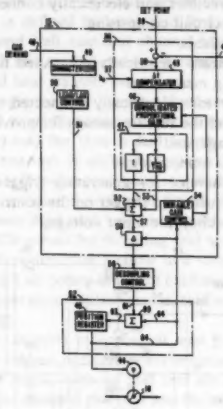
1. In a control apparatus for a plurality of independent industrial processes, with each said process including a process control member determining the operation of that process and providing a common operationally dependent intercoupling between said processes, the combination of:

means coupled with each of said processes for independently establishing the operation of the process control member determining the operation of that process,

means responsive to all of the established operations of the respective process control means for providing decoupled operational changes for the respective process control members, and

means provided for each process control member and re-

sponsive to the decoupled operational change for that process control member determining the operation of the



process control member for controlling the industrial process associated with that process control member.

4,500,951

PLANT CONTROL SYSTEM

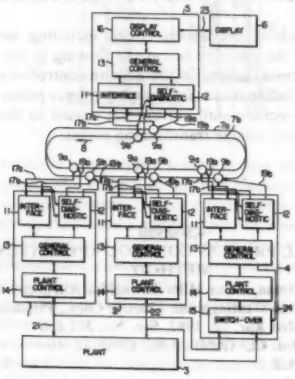
Norihiko Sugimoto, Katsuta; Nobuhiro Hamada, Hitachiota; Ikuro Masuda, Hitachi, and Jinichi Sakurai, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,689

Claims priority, application Japan, Jan. 7, 1981, 56-348; Mar. 31, 1981, 56-46459; Apr. 20, 1981, 56-58488

Int. Cl.³ G05B *23/02*; G06F *15/46*

U.S. Cl. 364—186 **5 Claims**



1. A loop communication system comprising a plurality of controller stations, at least one display station including means for displaying the status of each of said controller stations, and a loop transmission channel through which said controller stations and said display station are connected in a loop to permit data transmission between said controller and display stations while giving a transmission right to each of said controller and display stations in sequential order so that the station to which the transmission right is given is allowed to send out into the transmission channel data originating in that status, wherein each of said controller and display stations comprises a transmission interface circuit and a self-diagnostic circuit connected to said loop transmission channel, said transmission interface circuit in each station including means for effecting data transmission with the other stations by way of said transmission channel, and said self-diagnostic circuit in each station including means for diagnosing the operation of its station for the presence or absence of a malfunction and for disconnecting its station from said transmission channel when it diagnoses that its station is disabled, wherein said transmission channel includes loop transmission lines arranged in duplex, said transmission interface circuit in each station including means for receiving data from and applying data to one of said transmission lines for effecting data transmission between its station and the other stations by way of said one transmission line, and said self-diagnostic circuit in each station including means for selecting said one of said transmission lines and for disconnecting its station from said selected transmission line when it diagnoses that its station is disabled, and wherein said transmission interface circuit includes first selector means for selecting data received through one of said two loop transmission lines, register means for registering the received data selected by said first selector means, second selector means connected to said first selector means and said register means for selecting the data registered in said register means when the transmission right for data transmission over said selected transmission line has been received and for selecting the data supplied from said first selector means when the transmission right has not been received, transmission control circuit means for receiving the data selected by said second selector means and for processing said received data thereby producing processed data, and third selector means for selecting either the processed data or the data transmitted by the selected one of said transmission lines according to a signal determining a transmission mode and for supplying the data selected by said third selector means to the selected one of said two transmission lines; and said self-diagnostic circuit in each station includes first circuit means for receiving the data transmitted through said selected one of said transmission lines and for producing a first signal when said received data meets predetermined requirements indicating that the received data is normal, second circuit means for receiving the data transmitted to said selected one of said transmission lines and for producing a second signal when said received data meets predetermined requirements indicating that the received data is normal, and third circuit means for receiving a signal originating in the station having that third circuit means and producing a third signal when said received signal meets predetermined requirements indicating that the received signal is normal, and an AND gate connected to receive said first, second and third signals and producing a signal to select one of said transmission lines in the presence of all of said first, second and third signals.

4,500,952

MECHANISM FOR CONTROL OF ADDRESS TRANSLATION BY A PROGRAM USING A PLURALITY OF TRANSLATION TABLES

Andrew R. Heller, Morgan Hill, Calif., and William S. Worley, Jr., Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 23, 1980, Ser. No. 152,889

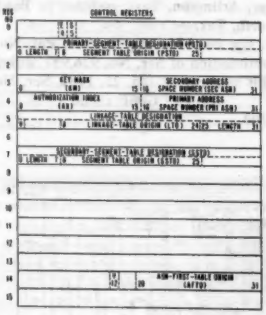
Int. Cl.³ G06F *9/36, 9/46, 13/00*

U.S. Cl. 364—200 **7 Claims**

1. In a multiprogramming data processing system including (1) a main memory comprised of physical, addressable blocks having associated addressable coded storage protect keys providing access control to the associated physical block, the main memory adaptable for storing information including data, problem programs, supervisor programs, and system control tables including addressable address translation tables for translating virtual addresses to real main memory addresses and (2) processor means for extracting and decoding series of program instructions from the main memory and for performing the operations required including the accessing of physical addressable blocks in the main memory for transfer of informa-

tion between the processor and main memory, the processor including a program status word (PSW) including a plurality of control bits including a problem program bit, the binary state of which signifies a problem or supervisor program state, control fields including a coded PSW protect key field to be compared with the coded storage protect key of a physical block to be accessed in main memory, and an instruction address value indicating the location of the next program instruction to be extracted, the improvement comprising:

a first addressing control register for storing the main memory address of a particular address translation table used



for translating addresses of an associated program from virtual to real main memory addresses;

a second addressing control register for storing a plural-bit address space number (ASN), an ASN comprising a symbolic identifier of, and being associated with, said particular address translation table addressed by said first addressing control register; and

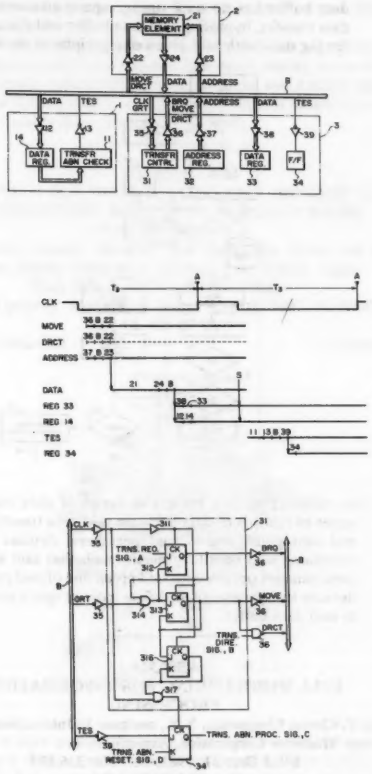
ASN translation means, including processor control means effective to transfer an ASN for storage in said second addressing control register, and for storing the address of the associated address translation table in said first addressing control register.

4,500,953
DATA TRANSFER ABNORMALITY PROCESSING SYSTEM

Fumihiko Takezoe, and Junichi Fujii, both of Tokyo, Japan, assignors to Fuji Facom Corporation, Tokyo and Fuji Electric Company Limited, Kanagawa, both of, Japan

Filed Jun. 23, 1981, Ser. No. 276,549
Claims priority, application Japan, Jun. 27, 1980, 55-86653
Int. Cl.³ G06F *9/00, 13/00*
U.S. Cl. 364—200 **5 Claims**

1. A data processing system comprising: a memory unit; at least one data processing unit; a common bus having a plurality of data lines and a transfer abnormality signal line indicative of transferred data being abnormal; a bus controller coupled to said common bus, data being transferred between said memory unit and said at least one data processing unit and/or between data processing units through said common bus under control of said bus controller in transfer cycle periods, said bus controller comprising means for producing a transfer abnormality signal corresponding to data transferred in a first cycle period during a second cycle period immediately subsequent said first cycle period, wherein a time between adjacent cycle periods is substantially unaffected by said transfer abnormality signal, wherein said means for producing said transfer abnormality signal comprises a data register for receiving data from said common bus and a transfer abnormality check circuit having data inputs coupled to data outputs of said data register, said data register delaying the application of data from said common bus to said transfer abnormality check circuit by one cycle period.



4,500,954
CACHE BYPASS SYSTEM WITH POST-BLOCK TRANSFER DIRECTORY EXAMINATIONS FOR UPDATING CACHE AND/OR MAINTAINING BYPASS

Alan H. Duke; Michael H. Hartung; Frederick J. Marschner, all of Pima County, Ariz., and Kenneth P. Nolan, Boulder County, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

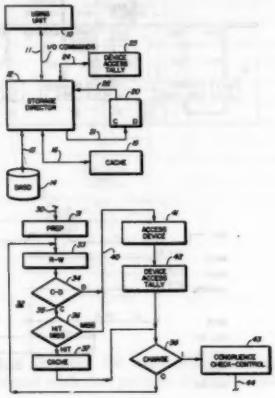
Filed Oct. 15, 1981, Ser. No. 311,570
Int. Cl.³ G06F *9/06, 13/00*
U.S. Cl. 364—200 **16 Claims**

1. The method of operating a buffered peripheral system having a plurality of peripheral devices connected to and sharing a random-access data buffer, directory means for indicating whether data stored or to be stored in a one of said peripheral devices has data storage spaced allocated therefor in said data buffer, data transfer means connected to said data buffer and to said peripheral devices for transferring data therewith and with external means external to said buffered peripheral system;

the improvement including the steps of:

initiating a data transfer for transferring a record of data, by addressing a given one of said peripheral devices, between said buffered peripheral system and said data transfer means by first examining said directory means to ascertain

whether said data buffer has data storage spaced allocated relating to said data transfer being initiated, if said data storage space is allocated, performing said data transfer between said buffer and said data transfer means; if said data buffer has no data storage space allocated for said data transfer, bypassing said data buffer and directly transferring data with said given one peripheral device; and



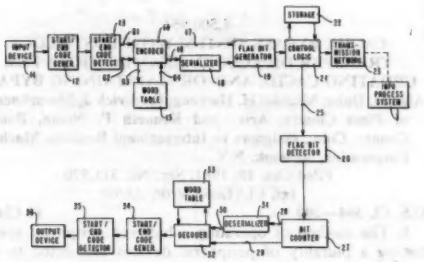
then transferring in a respective series of data transfers a series of records of data between said data transfer means and said given one of said peripheral devices without examining said directory means such that said series for data transfers occurs with said given one of said peripheral devices irrespective of said data storage space allocations in said data buffer.

4,500,955

FULL WORD CODING FOR INFORMATION PROCESSING

Ifay F. Chang, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,193
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—200 **3 Claims**



1. An information processing system comprising:

means for inputting alphanumeric words into the system, said alphanumeric words comprising serial aggregations of coded representations with a coded representation for each character in said alphanumeric words;

encoding means for matching each of said inputted alphanumeric words with a unique predetermined unitary representation which is independent of any reordering of the serial aggregations of the coded representations comprising an inputted alphanumeric word, said encoding means sequentially examining each coded representation for the characters in an inputted word and branching to a unique location in a tree search logic for each character, each said unique location containing a unique predetermined unitary representation, said encoding means outputting the unique predetermined unitary representation reached after sequentially examining an entire inputted word; and

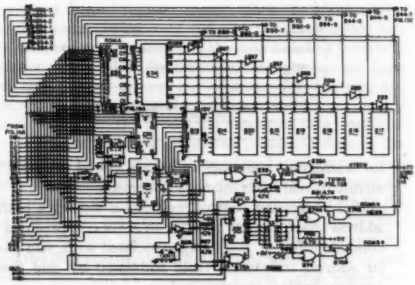
control logic means for directing such unique unitary representation in place of its corresponding alphanumeric word to a word processing apparatus.

4,500,956

MEMORY ADDRESSING SYSTEM

Steven Leininger, Arlington, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Division of Ser. No. 261,976, May 8, 1981, Pat. No. 4,430,649, which is a continuation of Ser. No. 926,957, Jul. 21, 1978, abandoned. This application Jan. 25, 1982, Ser. No. 342,069
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **8 Claims**



1. For a computer system including a central processing unit having data and address lines, means for storing instructions, a random access memory, keyboard means and display means,

said random access memory having input address terminals and control terminals, including an enable input,

first multiplexing means having two groups of input address lines coupled from the address lines of the central processing unit and control means for selectively coupling one of the groups of input address lines to the output of the multiplexing means,

means coupling the output of the multiplexing means to the address terminals of the random access memory,

and selection means in one position providing a memory enable signal for the random access memory and in another position coupling one of said address lines from the central processing unit to the enable input,

said control terminals further including a row address select terminal and a column address select terminal coupled from the central processing unit,

said selection means including a selectable shunt having one input for receiving the memory enable signal and another input for receiving an address signal from one of said address lines.

4,500,957

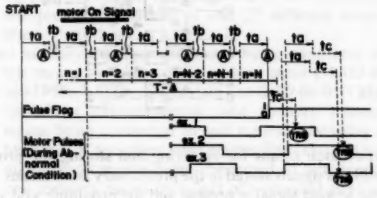
TIMING CONTROL SYSTEM FOR DETERMINING ABNORMAL MOTOR OPERATION

Hiroyuki Hanamoto, and Yoshihiro Horie, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1982, Ser. No. 360,989
Claims priority, application Japan, Mar. 27, 1981, 56-45812
Int. Cl.³ G06F *15/00*; G03G *15/00*
U.S. Cl. 364—200 **7 Claims**

1. In a control system for a machine including a programmed

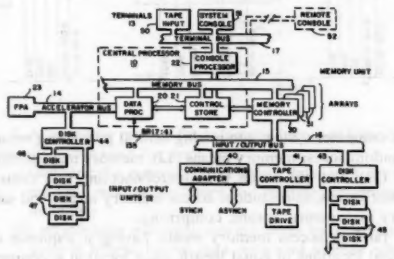
control device for controlling the sequence of operation of the machine, and a pulse generating means for generating pulse signals synchronized with a speed of a drive of the machine, said pulse signals being supplied to the programmed control device for synchronizing a control operation, which is performed by the programmed control, device with actual operation of the machine, the improvement wherein a program of the programmed control device is so designed that a control routine for executing a process necessary to control the machine and a synchronizing routine for controlling a time at which said control routine is to be started are executed continuously and repeatedly, said routines of said program being so associated with said pulse generating means that a number of pulses generated, when the machine is driven at a normal speed during a time period equal to a time required for completion of a succession of the control routine and the synchronizing routine, is at least two and that, said control routine is started immediately after generation of one of said pulses, during execution of said synchronizing routine, has been detected.



4,500,958
MEMORY CONTROLLER WITH DATA ROTATION ARRANGEMENT

John C. Manton, Marlboro, Mass., and Kenneth Okin, Saratoga, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 21, 1982, Ser. No. 370,572
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 21 Claims



1. A memory unit for connection in a data processing system ncluding a central processor unit and interconnection means ncluding means for transferring address, control and data ignals, the memory unit comprising a plurality of addressable torage locations each comprising a plurality of identifiable ub-locations and means for transferring data from or into a elected addressable storage location, said memory unit further omprising:

A. transfer data signal storage means connected to said data transferring means for storing data signals that have been transferred from or that are to be transferred into an addressable storage location;

B. rotation means connected to said interconnection means and to said data transferring means for rotating said data signals in response to the address and control signals;

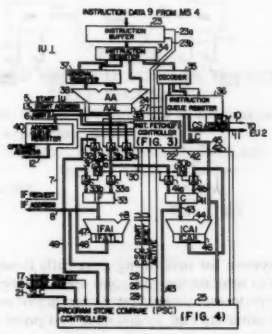
C. rotated data signal storage means connected to said rotating means, said transfer data signal storing means, and to said interconnection means for storing said rotated data signals; and

D. control means connected to said rotated data signal storing means and to said transfer data signal storing means for selectively transferring data signals from said rotated data signal storing means to said interconnection means and to said transfer data signal storing means.

4,500,959
APPARATUS FOR INVALIDATING THE CONTENT OF AN INSTRUCTION BUFFER BY PROGRAM STORE COMPARE CHECK

Kanji Kubo; Tsugio Momose, and Chikahiko Izumi, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,587
Claims priority, application Japan, May 11, 1981, 56-69458
Int. Cl.[3] G06F *9/30*
U.S. Cl. 364—200 12 Claims



1. In a data processing system in which instructions are prefetched from a main storage to an instruction buffer in advance of the execution of an instruction in response to an instruction fetch address and the instructions are read out from said instruction buffer for execution, the improvement comprising:

prefetch means for specifying an instruction fetch address of an instruction to be fetched from said main storage to said instruction buffer;

means for specifying an execution instruction address of an instruction to be executed and first information indicating the byte position at which said instruction is stored in said main storage;

means for specifying a store address by a store instruction and second information indicating the byte position of the content in the main storage which is changed by a store operation;

detection means for detecting that the content of the instruction fetched from said main storage to said instruction buffer has been changed in said main storage as a result of said store operation and that the execution of the instructions has proceeded to the instructions changed in said main storage, based on said fetch address, said execution instruction address, said first information, and store address and said second information;

suppression means for suppressing operation of said prefetch means in response to the detection by said detection means that the content of the instruction fetched from said main storage to said instruction buffer has changed in said main storage as a result of said store operation; and

invalidating means for invalidating the content of said in-

struction buffer in response to the detection by said detection means that the execution of the instruction has proceeded to the instruction changed in said main storage.

4,500,960

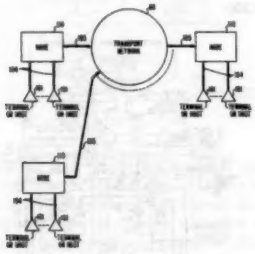
GEOGRAPHICALLY DISTRIBUTED MULTIPROCESSOR TIME-SHARED COMMUNICATION PROCESSING SYSTEM

Glenn R. Babecki, Lawrenceville; Carlos Escolar, East Windsor; Craig M. Garnant, Middletown; Hsin-Kuo Kan, Holmdel; Frank Kaplan, Warren; Hueichi R. Liu, Marlboro; George F. MacLachlan, Tinton Falls; Peter J. Matteo, Eatontown; John F. McDonald, Watchung; John D. Palframan, Aberdeen; Roger T. Tran, Marlboro; Martin J. Welt, Middletown, all of N.J.; Timothy A. Wendt, New York, N.Y.; Gregory S. Yates, Aberdeen, and Paul M. Zislis, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 28, 1982, Ser. No. 393,138

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **6 Claims**



1. In a system for processing data calls from initiating end point users to terminating end point users, the system including at least one processor supporting a plurality of processes adaptable to the initiating and terminating end point users:

a process in the processor for interfacing an external communication link;

an internal communication subsystem for exchanging data between the processes through links internal to the processor in accordance with communication parameters defined by control data passed through the internal links during call initiation, at least one of the internal links extending to the interfacing process; and

means invoked by the interfacing process during call initiation for applying the control data on the one internal link to the external communication link when the terminating end point user is accessed by way of the external communication link and for processing the control data when the terminating end point user is the interfacing process.

4,500,961

PAGE MODE MEMORY SYSTEM

Bruce E. Engles, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 3, 1983, Ser. No. 500,705

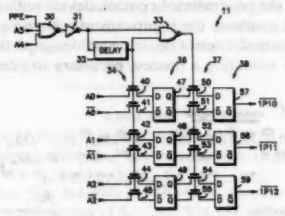
Int. Cl.³ G06F *9/30*

U.S. Cl. 364—200 **8 Claims**

1. In a multi-page ROM having a plurality of pointers which are selectively programmable to provide page address signals which correspond to a chosen page of the ROM and which are programmed in response to a particular program address, the improvement comprising a pointer responsive to the occurence and removal of a first program address which comprises:

delay control means for providing a first signal a first predetermined delay period following the removal of the first program address, for providing a second signal and removing the first signal a second predetermined delay period following the occurrence of the first program address, and for removing the second signal in response to the removal of the first program address;

preliminary latch means for receiving and storing program address signals when the first signal is present;



output latch means for receiving and storing the program address signals stored in the preliminary latch means when the second signal is present and for providing said stored program address signals as the page address signals.

4,500,962

COMPUTER SYSTEM HAVING AN EXTENDED DIRECTLY ADDRESSABLE MEMORY SPACE

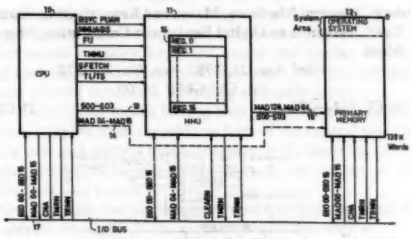
Edmond Lemaire, Maurepas par Trappes, and Jacques Lebreton, Saclay par Orsay, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 288,565, Jul. 30, 1981, , which is a continuation of Ser. No. 42,660, May 25, 1979, abandoned. This application Sep. 22, 1983, Ser. No. 534,266

Claims priority, application France, Jun. 15, 1978, 7817898

Int. Cl.³ G06F *9/06*

U.S. Cl. 364—200 **3 Claims**



1. A computer system comprising central processing means (10) random access memory means (12), memory management means (11); and bus means (17) interconnecting said central processor means, said random access memory means and said memory management means, comprising:

said random access memory means having a sequence of word locations of equal length, each location accommodating a word, a predetermined fraction of said word locations containing two character locations of equal length, each location accommodating a character being half as long as a word, said random access memory means being connected to said bus means by means of an address input (MAD 00—MAD 15), a bidirectional data line (BIO 00-BIO 15), a character selection signal (CHA) input, and a handshake interconnection (TMRX, TRMN);

said central processing means being connected to said bus means by means of an address output (MAD 00—MAD 15), a bidirectional data line (BIO 00-BIO 15), a character selection signal (CHA) output, and a handshake interconnection;

said central processing means having address generating

means for generating N-bit addresses on said address output, and first signalling means for generating a character detection signal, a first value of said character detection signal signalling that an accompanying address is directed to a word location as one of 2^N different word locations;

a second value of said character selection signal signalling that an accompanying address is directed to a character location, in that one predetermined address bit operates as first/second character location selecting bit, the remaining (N−1) bits then operating to select a word location in one predetermined half of said 2^N different word locations;

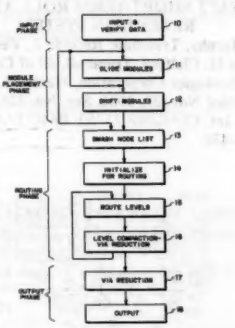
said memory management means being connected to said bus means by means of an address input (**MAD 00 . . . MAD 15**), a bidirectional data line (**BIO 00-BIO 15**) and a handshake interconnection, said memory management means being connected to said central processing means by means of a segment table pointer line (**13**), said memory management means being connected to said random access memory means by means of a physical page number line (**16**) for forwarding a page selection signal.

4,500,963

AUTOMATIC LAYOUT PROGRAM FOR HYBRID MICROCIRCUITS (HYPAR)

David C. Smith, Williamstown, and Richard Noto, Maple Shade, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 29, 1982, Ser. No. 445,341
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—300 **6 Claims**



1. A computer process for automatic layout of hybrid microcircuits comprising the steps of:

(a) defining the general hybrid layout data, an X-Y orthogonal grid, module geometry and relative placement, and a node list;

(b) establishing potential routing areas by combining said general hybrid layout data with said module placement data;

(c) creating a routing subset having all grid point information for the available routing levels;

(d) smashing the node list into source-pin/sink-pin pairs and sorting the pairs according to a specified routing priority criteria;

(e) selecting a source-pin/sink-pin pair for routing;

(f) energizing available paths between said source-pin and said sink-pin;

(g) creating an energy level record for each of said energized paths;

(h) establishing said sink-pin as the current point of routing;

(i) creating a subset of all energized points from said current point of routing which satisfy the minimum criteria of a decreased energy level;

(j) establishing selection criteria for choosing the next point of routing;

(k) evaluating all points in the subset created in step (i) by the criteria established in step (j);

(l) routing to the point having the best evaluation data from step (k);

(m) repeating step (i) through step (m) until the source-pin is reached;

(n) repeating step (e) through step (n) for each source-pin/-sink-pair determined in step (d) until either:

(i) no further routing paths exist on the available, routing levels, or

(ii) no source-pin/sink-pin pairs remain;

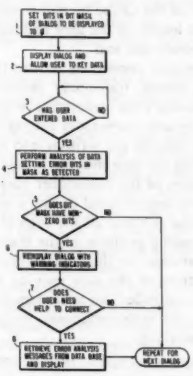
(o) translating all connection data in to a language suitable for describing the fabrication layout of the hybrid module.

4,500,964

DIALOG USER ERROR DIAGNOSIS, SEVERITY, AND HELP TECHNIQUE

Allen F. Nickle, Euless, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1983, Ser. No. 480,420
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—300 **3 Claims**


SET BITS IN BIT MASK OF DIALOG TO BE DISPLAYED TO 0
DISPLAY DIALOG AND ALLOW USER TO KEY DATA
HAS USER ENTERED DATA
NO
YES
PERFORM ANALYSIS OF DATA SETTING ERROR BITS IN MASK AS DETECTED
DOES BIT MASK HAVE NON-ZERO BITS
NO
YES
REDISPLAY DIALOG WITH WARNING INDICATORS
DOES USER NEED HELP TO CORRECT
NO
YES
RETRIEVE ERROR ANALYSIS MESSAGES FROM DATA BASE AND DISPLAY
REPEAT FOR NEXT DIALOG

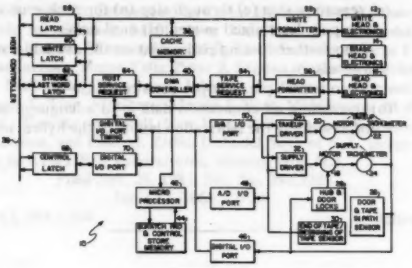
1. In an interactive data entry system of the type wherein a dialog is displayed requiring a user to key in certain specified data and then enter that data, the system then performing an error analysis of the entered data in the sequence of (1) individual keyed data field validity, (2) interaction of one keyed data field with another, and (3) interaction of keyed data with previously specified data or other application related limits and setting related error bits in a mask as errors are detected, and if the error mask has any non-zero bits, then redisplaying the dialog with warning indicators, the improvement of a method of providing an extended error diagnosis of all errors to assist the user in correcting the errors, said method comprising the step of building a data base of extended diagnostic error messages sets for each type of error for each data field of each data entry dialog, each set of extended diagnostic error messages being uniquely addressed in said data base by at least the name of the corresponding data entry dialog and said bit mask.

4,500,965

CAPSTANLESS MAGNETIC TAPE DRIVE WITH ELECTRONIC EQUIVALENT TO LENGTH OF TAPE

Martin D. Gray, La Jolla, Calif., assignor to Cipher Data Products, Inc., San Diego, Calif.

Filed Jun. 4, 1982, Ser. No. 385,082
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—400 **8 Claims**



1. A magnetic tape drive operative with a host controller for reading and writing sequential data records comprising:

transducer means for writing the data records on magnetic tape and for reading the data records therefrom;

means for selectively moving the tape in forward and rearward directions past the transducer means;

means for sensing a position of the transducer means on the tape;

a cache memory for storing the data records to be written on, and the data records read from, the tape, a data storage capacity of the cache memory corresponding to a predetermined length of the tape and having forward and rearward boundaries; and

circuitry means connected to the transducer means, tape moving means, transducer position sensing means and cache memory for generating a logical head that moves forwardly and rearwardly through the cache memory as the data records are written into and read therefrom, for controlling the tape moving means to cause a corresponding position of the transducer means to approach a position of the logical head during a write operation, and for causing the position of the logical head to approach the corresponding position of the transducer means during a read operation so that delays due to accelerations and decelerations of the tape moving means are masked and the host controller can instantaneously read data bi-directionally and instantaneously switch between read and write operations.

4,500,966

SUPER CONTINGENCY AIRCRAFT ENGINE CONTROL

Raymond D. Zagranski, Somers; James J. Howlett, North Haven, and Nicholas D. Lappos, Madison, all of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed May 26, 1982, Ser. No. 382,258
Int. Cl.³ G06F *15/50*; G05B *13/02*; F02C *9/42*
U.S. Cl. 364—432 **7 Claims**

1. A control for an aircraft engine, comprising:

means for providing a speed signal indicative of engine speed;

means for providing an engine signal indicative of at least one additional engine operating parameter;

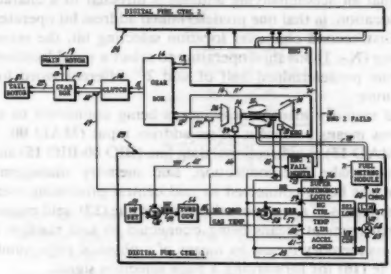
means for metering fuel to the engine in response to a fuel command signal provided thereto; and

signal processing means for providing, in response to said speed signal and said engine signal, said fuel command signal under constraint of normal engine limits;

wherein the improvement comprises:

means for providing a flight parameter signal indicative of an aircraft flight parameter directly dependent on engine power; and

said signal processing means comprising means responsive to said flight parameter signal for providing a super contingency signal indicative of a need for engine power in excess of engine power available at rated engine conditions, and responsive to said super contingency signal for providing, in response to said speed signal and said engine signal, said fuel command signal under constraint of super contingency engine limits which are higher than said normal engine limits.

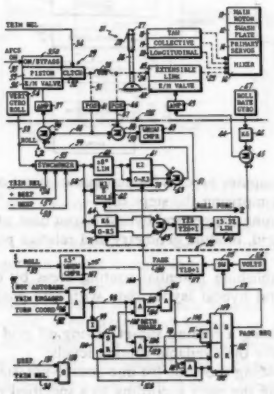


4,500,967

AIRCRAFT SHORT-TERM ROLL ATTITUDE RETENTION SYSTEM

Richard D. Murphy, Trumbull; Ricardo L. Perez, Southington, and Douglas H. Clelford, Trumbull, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 27, 1981, Ser. No. 325,391
Int. Cl.³ G06F *15/50*; B64C *11/00*
U.S. Cl. 364—434 **3 Claims**



1. An aircraft automatic flight control system comprising:

a vertical gyro providing a roll axis output signal indicative of the direction and magnitude of bank angle of the aircraft with respect to level;

roll control means, including a pilot control stick and actuator means including a roll attitude retention outer loop portion and a roll stability inner loop portion, for providing commands to the control surfaces of the aircraft for controlling the roll attitude of the aircraft, lateral force on

said control stick providing input commands to said control surfaces which override input commands related to the positioning of said roll attitude retention outer loop portion; and

signal processing means responsive to said roll axis output signal of said vertical gyro and connected to said roll control means, for selectively providing a desired roll attitude reference signal, for providing a roll error signal indicative of the difference in roll attitude indicated by said desired roll attitude reference signal and said roll axis output signal, responsive to said roll control means for providing a signal indicative of lateral force in excess of a predetermined threshold magnitude being applied to said control stick, for providing to said roll attitude retention outer loop portion a first roll command signal which is a first proportional function of said roll error signal in response to the presence of said force signal and which is both said first proportional function and an integral function of said roll error signal in response to the absence of said force signal, for providing a second roll command signal to said roll stability inner loop portion which is a second proportional function of said roll error signal;

characterized by:

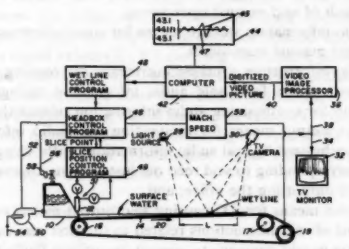
said signal processing means providing said second roll command signal to said roll stability inner loop portion which is a washed out proportion of said roll error signal, whereby a turn induced by lateral force applied to said control stick against a trim position established by said roll attitude retention outer loop portion in response to said roll error signal will be stabilized by said roll stability inner loop portion responding to said washed out function of said roll error signal to stabilize the aircraft against attitude perturbations which result in short-term changes in said roll error signal.

4,500,968

PAPER MACHINE WET LINE CONTROL

Wojciech L. Bialkowski, Richmond Hill, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Jun. 29, 1982, Ser. No. 393,457
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—471 **4 Claims**



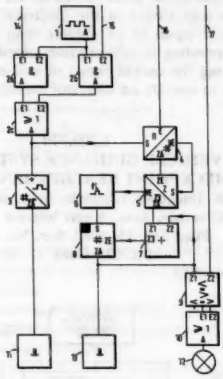
1. A method for continuously monitoring the position of the wet line on a paper machine comprising continuously generating a video signal representing the surface of a wire of said paper machine in the area where the wet line is normally located, digitizing the video signal so generated to provide a digitized signal, processing said digitized signal to define a line corresponding to the wet line on the machine, and displaying the wet line defined by said processed digitized video signal.

4,500,969

METHOD AND APPARATUS FOR DETERMINING STRESS ON HOISTING EQUIPMENT

Heinz Hasselmann, Hagen, and Anton Muenzebrock, Witten, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 15, 1981, Ser. No. 331,015
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048964
Int. Cl.³ G01M *17/00*; G08B *21/00*
U.S. Cl. 364—508 **15 Claims**



1. A method for determining the stress on hoisting equipment characterized by a value indicative of such stress and determined as a function of the load and running time of said hoisting equipment, comprising the steps of

(a) generating a series of constant time interval electrical signals,

(b) generating an electrical signal upon and during operation of said hoisting equipment to indicate operation of the hoisting equipment,

(c) conducting said series of constant time interval electrical signals and said electrical signal to indicate operation of said hoisting equipment to the input means of an AND gate electrical means whereby said AND gate means generates an output when both the series of constant time interval signals and the signal to indicate the operation of the hoisting equipment are conducted to said input means of the AND gate electrical means,

(d) generating a signal corresponding to the value of the load being handled by said hoisting equipment,

(e) conducting said signal corresponding to the value of the load to an electrical calculating means,

(f) utilizing the output of said AND gate means to control the operation of said electrical calculating means whereby said electrical calculating means calculates the cube of the value corresponding to the load during the time interval of each particular one of the series of constant time interval electrical signals and generates an electrical signal corresponding to each calculation,

(g) conducting said electrical signals corresponding to the cubes of the values of the load during each particular one of the series of constant time interval electrical signals sequentially to an electrical adding and storage means whereby the value of each signal is stored and added to a sum representing the total value of the signals corresponding to the cube of the load during each time interval of each particular one of the series of constant time interval electrical signals which have been conducted to said electrical adding and storage means and an electrical signal corresponding to said sum is generated,

(h) generating an electrical signal corresponding to a predetermined maximum sum for the cubes of the values of the

load during each particular one of the series of constant time interval electrical signals,

(i) conducting the electrical signal corresponding to said predetermined maximum sum and the electrical signal corresponding to the sum stored in said adding and storage means to input means of an electrical comparator means,

(j) operating said electrical comparator means to compare the signal corresponding to the sum stored in the electrical adding and storage means with the electrical signal corresponding to the value of said predetermined maximum sum whereby the electrical comparator means generates an output signal when the electrical signal corresponding to the sum stored in the electrical adding and storage means is equal to or greater than the electrical signal corresponding to said predetermined maximum sum, and

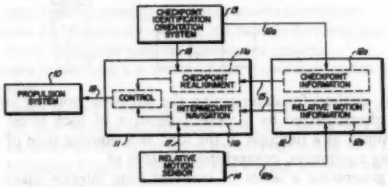
(k) utilizing the output signal of said electrical comparator means to operate an indicator means.

4,500,970

ROBOT VEHICLE GUIDANCE SYSTEM INCLUDING CHECKPOINT REALIGNMENT SYSTEM

Johnathan E. Daemmer, Glendale, Ariz., assignor to Richard A. Boulais, Glendale, Ariz., a part interest

Filed Jan. 15, 1982, Ser. No. 339,426
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—513 **1 Claim**



1. In a guidance system for a robot vehicle, including

relative motion sensor means for initially detecting the relative motion of said vehicle with respect to its environment along a pre-selected guidepath between a start position and a finish position and for generating signals representing learned behavior in the form of initial vehicle-guidepath relative motion information,

memory means for storing said initial relative motion information,

means for recalling said initial relative motion information and converting said information to vehicle guidance signals,

propulsion means responsive to said guidance signals, to cause said vehicle to repeat the learned behavior embodied in said stored initial vehicle-guidepath relative motion information,

the improvements in said guidance system which enable said robot to move from the start position to the finish position without reliance on a pre-selected guidepath therebetween and without compounding anomalous guidance errors induced by extraneous environmental effects, said improvements comprising, in combination with said guidance system:

(a) means for initially identifying environmental checkpoints and locating each of these checkpoints in relation to at least certain other environmental checkpoints and for initially establishing the orientation of said vehicle with respect to said checkpoints;

(b) means for storing said initial vehicle-checkpoint orientation information;

(c) means for recalling said initial vehicle-checkpoint orientation information in later operations of the vehicle within said environment;

(d) means for sensing actual vehicle-checkpoint orientation during said later operations and for comparing said actual orientation information with said recalled orientation information and generating vehicle-checkpoint realignment signals; and

(e) propulsion means responsive to

(i) said relative motion guidance signals for intermediate navigation of said vehicle between said checkpoints, and

(ii) said vehicle-checkpoint realignment signals to realign said vehicle with respect to said checkpoints to said initial alignment,

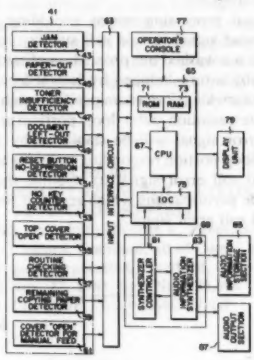
to guide said vehicle from said start position to said finish position.

4,500,971

ELECTRONIC COPYING MACHINE

Kenji Futaki, Kawasaki, and Hitoshi Dekura, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 29, 1982, Ser. No. 363,387
Claims priority, application Japan, Mar. 31, 1981, 56-48073
Int. Cl.³ G10L *1/00*; G03G *15/00*
U.S. Cl. 364—513.5 **7 Claims**



1. An electronic copying machine comprising:

a copying machine main body;

fault detecting means for detecting at least one fault in an operation of said copying machine main body, each said fault being correctable by a sequence of manual operations;

operation detecting means for detecting the occurrence of each of said manual operations;

audio information storage means for storing instructions for said manual operations;

audio information synthesizing means for reading out said instructions from said audio information storage means and for synthesizing audio information related thereto;

voice output means for converting the audio information synthesized by said audio information synthesizing means, corresponding to said read out instructions, to a voice and for outputting the voice; and

control means for: (1) causing said output means to output one of said instructions related to the first manual operation in said sequence to correct one of said faults detected by said fault detecting means, (2) causing said output means to output one of said instructions related to the next manual operation in said sequence to correct said detected fault when said operation detecting means detects the occurrence of said manual operation previously instructed by output of said output means, and (3) repeating said function (2) until instructions for all of said manual operations necessary to correct said detected fault have been outputted by said output means.

4,500,972

APPARATUS FOR CONVERTING DIGITAL CHROMINANCE SIGNALS OF A CARTESIAN COLOR COORDINATE SYSTEM INTO DIGITAL COLOR SIGNALS AND SATURATION SIGNALS OF A POLAR COLOR COORDINATE SYSTEM AND A TRANSFORMATION CIRCUIT

Franz Kuhn, Schonkirchen; Wilfried Lippek; Klaus Möllgaard, both of Kiel, and Friedrich Redecker, Heikendorf, all of Fed. Rep. of Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

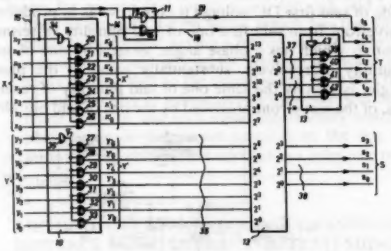
PCT No. PCT/DE80/00138, § 371 Date Jun. 5, 1981, § 102(e) Date May 28, 1981, PCT Pub. No. WO81/01065, PCT Pub. Date Apr. 16, 1981

PCT Filed Sep. 26, 1980, Ser. No. 269,015

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1979, 2940440; Oct. 5, 1979, 2940422; Oct. 5, 1979, 2940439

Int. Cl.³ G06F *15/20, 7/548;* G01J *3/46*

U.S. Cl. 364—526 15 Claims



1. A coordinate transformation circuit for converting digital chrominance signals of a first cartesian color coordinate system into digital hue signals and saturation signals of a polar color coordinate system, whereby a second cartesian color coordinate system (8) with axes parallel to the first cartesian color coordinate system (1) is placed through the center point (P'_o) of the polar color coordinate system (4), said second cartesian color coordinate system (8) dividing the polar color coordinate system (4) into four quadrants, which are defined by digital quadrant identification numbers, comprising:

a. means for converting the pairs of digital chrominance signal values (X; Y), defining the positions of the color locations (F) within the first cartesian color coordinate system (1) into corresponding pairs of second chrominance signal values (X'; Y'), defining the relative positions of said color locations (F) within a selected quadrant of the second cartesian color coordinate system (8),

b. means for generating digital hue signal values (T*) for said selected quadrant and saturation signal values (S) from said pairs of second chrominance signal values (X'; Y') according to the equations:

$$T^* = C_2 \arctan (Y'/X') \text{ and}$$

$$S = C_1\sqrt{X'^2 + Y'^2}$$

wherein C_1 and C_2 are constant factors, and

c. means for determining the quadrant identification numbers of the quadrants, in which the respective color locations (F) fall, from said first chrominance signal values (X; Y), whereby the hue signal values (T) for all quadrants are obtained from said determined quadrant identification numbers and said hue signal values (T*) of said selected quadrant.

4,500,973

ELECTRONIC DEVICES

Anthony J. Ley, Los Alto Hills, Calif. 94022, assignor to Enertec, Montrouge, France

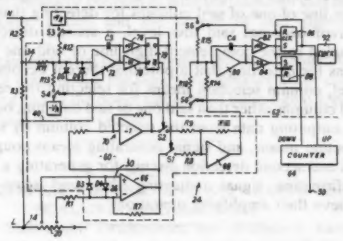
Division of Ser. No. 905,450, May 12, 1978, Pat. No. 4,359,684.

This application Sep. 28, 1982, Ser. No. 425,737

Claims priority, application United Kingdom, May 16, 1977, 20564/77

Int. Cl.³ G06J *1/00;* G06G *7/16*

U.S. Cl. 364—606 19 Claims



1. An electronic circuit for producing an output signal representative of the time integral of the product of two input signals, the circuit comprising:

a multiplier for receiving and multiplying together the two input signals to produce a signal dependent upon the product of the two input signals;

a signal-to-frequency converter arranged to convert the product-dependent signal to a pulse signal whose pulse rate is dependent upon the magnitude of the product-dependent signal;

a reversible counter connected to receive and count the pulses of the pulse signal so as to produce said output signal; and

means for repetitively and simultaneously reversing the effective polarity of one of the input signals and the direction of counting of the reversible counter, whereby to substantially reduce errors in said output signal due to drift in the multiplier;

wherein the reversible counter includes means responsive to a first predetermined count therein to reset the counter to a second predetermined count, the difference between said first and second predetermined counts being less than the full house count of the counter.

4,500,974

MEMORY CIRCUIT

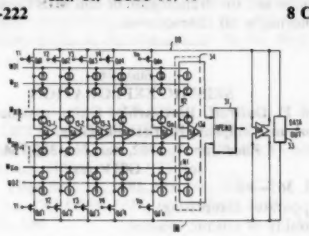
Akira Nagami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 428,517

Claims priority, application Japan, Sep. 29, 1981, 56-154347

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—222 8 Claims



4. A memory circuit comprising a plurality of memory cells

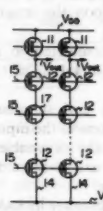
arrayed in rows and columns, a sense amplifier for each column, a true digit line and a complement digit line for each sense amplifier, the memory cells in each column being connected to at least one of the respective digit lines when the respective memory cells are enabled in a selected row thereby to cause a difference in potential between the true and complement digit lines in the same column, control means for operatively enabling said sense amplifiers thereby to make a potential at one of the true and complement digit lines at a low level and a potential at the other of the true and complement digit lines at a high level, a first detection circuit coupled to the true digit line of one of said columns for detecting that a potential thereof becomes said low level, a second detection circuit coupled to the complement digit line of said one of said columns for detecting that a potential thereof becomes said low level, column selection means for selecting the remainder of said columns other than said one of said columns, output means for outputing data from the selected column by said column selection means, and signal generating means coupled to said first and second detection circuits for generating a refresh end confirmation signal indicating that said sense amplifiers achieve their amplifying operations.

4,500,975

MASK ROM-TYPE SEMICONDUCTOR MEMORY DEVICE

Takehide Shirato, Hiratsuka, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 16, 1981, Ser. No. 331,478
Claims priority, application Japan, Dec. 26, 1980, 55-186886
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—104 **5 Claims**



1. A read-only memory semiconductor device comprising:
a plurality of MIS (metal insulator semiconductor)-type transistors arranged in a matrix, with each of said MIS-type transistors corresponding to one memory information bit and having a source region and a drain region, some of said MIS-type transistors having a normally on characteristic, and the remaining of said MIS-type transistors having a normally off characteristic; and
at least one of said MIS-type transistors having a normally on characteristic and having a source region and a drain region with a greater depth than the depth of the source region and the drain region of said MIS transistors having a normally off characteristic.

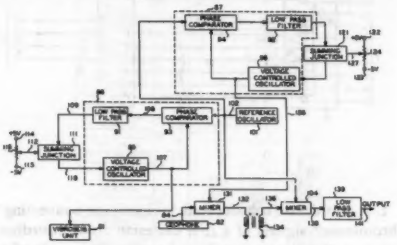
4,500,976

SEISMIC EXPLORATION

Richard E. DuBroff, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 7, 1982, Ser. No. 385,754
Int. Cl.[3] G01V *1/00*
U.S. Cl. 367—48 **4 Claims**

1. Apparatus comprising:
a plurality of seismic sources;
a plurality of seismic receivers;
a first phase comparator having first and second inputs and an output;
means for providing a reference signal having the form cos Ωt to the first input of said first phase comparator, wherein Ω is the frequency of said reference signal;
a first voltage controlled oscillator having an input and an output;
means for providing an output signal from the output of said first voltage controlled oscillator to the second input of said first phase comparator, wherein said first phase comparator establishes a first signal which is proportional to the phase difference between said reference signal and the output signal from said first voltage controlled oscillator;
means for combining a first DC voltage with said first signal to produce a first combined signal;
means for providing said first combined signal to the input of said first voltage controlled oscillator, wherein the output signal from said first voltage controlled oscillator has the form cos $(\Omega t+\phi_1)$ and wherein ϕ_1 is a phase angle which is determined by the magnitude of said first DC voltage;
means for controlling a first one of said plurality of seismic sources in response to the output signal from said first voltage controlled oscillator, wherein the phase angle of the wavefront induced into the earth by said first one of said plurality of seismic sources is ϕ_1, wherein the magnitude of said first DC voltage is chosen so as to produce a wavefront from said first one of said plurality of seismic sources which has a phase angle, as seen by one of said plurality of receivers, substantially equal to the phase angle, as seen by the same one of said plurality of receivers, of the wavefront produced by the one of said plurality



of seismic sources which is selected as a reference seismic source, wherein a wavefront from each one of said plurality of seismic sources is received by each one of said plurality of seismic receivers and wherein a first one of said seismic receivers provides an output signal having the form cos $\Omega t+\phi_2$ where ϕ_2 is the phase angle, as seen by said first one of said seismic receivers, of the wavefront produced by said reference seismic source;
a second phase comparator having first and second inputs and an output;
means for providing said reference signal to the first input of said second phase comparator;
a second voltage controlled oscillator having an input and an output;
means for providing an output signal from the output of said second voltage controlled oscillator to the second input of said second phase comparator, wherein said second phase comparator establishes a second signal which is proportional to the phase difference between said reference signal and the output signal from said second voltage controlled oscillator;
means for combining a second DC voltage with said second signal to produce a second combined signal;
means for providing said second combined signal to the input of said second voltage controlled oscillator, wherein the output signal from said second voltage controlled oscillator has the form cos $(\omega t+\phi_3)$ and wherein ϕ_3 is a phase angle which is determined by the magnitude of said second DC voltage;

a first mixer having first and second inputs and an output;
means for providing the output signal from said first one of said plurality of seismic receivers to the first input of said first mixer;
means for providing the output signal from said second voltage controlled oscillator to the second input of said first mixer, wherein said first mixer establishes a third signal which is representative of the result of mixing the output signal from said second voltage controlled oscillator and wherein said third signal has a DC component and a component having a frequency of 2Ω;
means for removing a DC component from a signal;
a second mixer having first and second inputs and an output;
means for providing said third signal from the output of said first mixer through said means for removing a DC component from a signal to the first input of said second mixer;
means for providing said reference signal to the second input of said second mixer, wherein said second mixer establishes a fourth signal representative of the result of mixing the 2Ω component of said third signal and said reference signal;
a low pass filter; and
means for passing said fourth signal through said low pass filter to establish a fifth signal which has the form of a phase shifted signal having a frequency of Ω, wherein the magnitude of said second DC voltage is chosen so as to apply a phase shift to the output signal from said first one of said plurality of seismic receivers which will make the phase angle of said fifth signal substantially equal to the phase angle of the output signal from the one of said seismic receivers which is selected as a reference receiver.

4,500,977

METHOD AND APPARATUS FOR MEASURING A DISTANCE USING ULTRASONIC ECHO SIGNALS, PARTICULARLY FOR USE ON A MOTOR VEHICLE

Egon Gelhard, Thomas-Mann-Str. 10, D-5000 Köln, 51, Fed. Rep. of Germany

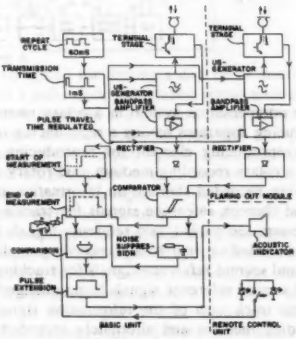
PCT No. PCT/DE81/00153, § 371 Date May 25, 1982, § 102(e) Date May 25, 1982, PCT Pub. No. WO82/01256, PCT Pub. Date Apr. 15, 1982

PCT Filed Sep. 24, 1981, Ser. No. 385,382

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1980, 3036081

Int. Cl.³ G01S *15/18, 15/93*

U.S. Cl. 367—108 **9 Claims**



1. A circuit for measuring and indicating the separation distance between a vehicle and adjacent obstacles, comprising:
pulse controlled ultrasonic generator,
ultrasonic transmit-receive transducer connected to said generator for transmitting direct ultrasonic pulse signals to the ostacles, and wherein the ultrasonic signals reflected by the obstacles are received by said transducer;
an amplifier and detector circuit coupled to said transducer output for receiving and detecting both transmitted and received pulse signals;
a first comparator coupled to the output of said amplifier and detector circuit,
a start-stop counter coupled to the output of said first comparator for measuring the difference in time between the end of the transmitted ultrasonic signal, and the reception of the reflected signal from the obstacle;
a noise suppression circuit coupled to the output of said first comparator;
a second comparator coupled to both the output of said noise suppression circuit and the output of said start-stop counter;
wherein said start-stop counter begins the measurement time used for determining the separation distance at the corresponding end of the direct transmitted pulse signal appearing in said receiver circuit.

4,500,978

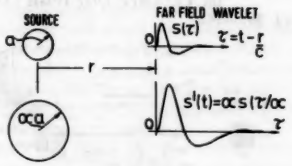
SEISMOGRAPHIC METHOD AND APPARATUS USING SCALED SOUND SOURCES

Antoni M. Ziolkowski, Twickenham, and William E. Lerwill, Keston, both of England, assignors to Seismograph Service Corporation, Tulsa, Okla.

Continuation of Ser. No. 142,924, Apr. 23, 1980, abandoned. This application Jul. 16, 1982, Ser. No. 399,119

Int. Cl.³ G01V *1/13, 1/40*

U.S. Cl. 367—142 **17 Claims**



1. A method of determining the location of sub-surface boundaries and/or the acoustic properties of sub-surface features in the earth, which method comprises employing a first point sound source and subsequently but at the same location as that of said first point sound source a second point sound source of the same type as the first point sound source to produce first and second mutually non-interfering sound waves of the same shape but at a different amplitude and time scale, the energy of the elastic radiation of the first source differing by a known factor from the energy of the elastic radiation of the second source and being such that the frequency spectra of the respective sound waves overlap, detecting reflections of said first and second sound waves from within the earth and generating therefrom respective first and second seismic signals and subjecting these two seismic signals to analysis and comparison to define the impulse response of the earth substantially in the absence of the far field source wavelet and noise.

4,500,979

OPTICAL SEISMIC TRANSDUCER

Gary L. Scott, Sugarland, Tex., assignor to Western Geophysical Co of America, Houston, Tex.

Filed Sep. 16, 1981, Ser. No. 302,873

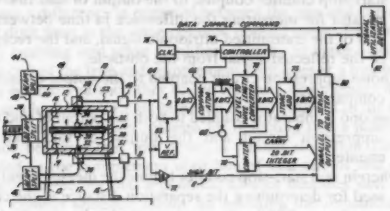
Int. Cl.³ G01V *1/16, 1/18;* **G01D** *5/26*

U.S. Cl. 367—149 **13 Claims**

1. An improved seismic transducer of the type including a mass resiliently mounted for relative motion with respect to an earth-contacting housing in response to seismic waves and means for detecting motion of the mass with respect to the

housing utilizing a beam of coherent radiation reflected from a first face of the mass, wherein the improvement comprises:

means for reflecting a second beam of coherent radiation from a face of the mass opposite to the first face;



means for creating a pair of interference fringe patterns by separately combining each of the beams of coherent radiation with one or more reference beams; and

means for processing said interference fringe patterns to determine the magnitude and direction of said relative motion.

4,500,980

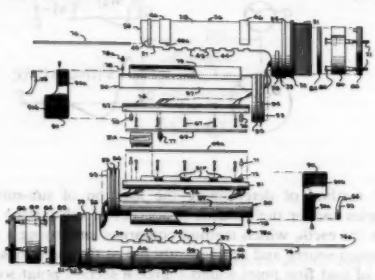
SEISMIC STREAMER CONNECTOR ASSEMBLY

James R. Copeland, Irving, Tex., assignor to Whitehall Corporation, Dallas, Tex.

Filed Aug. 24, 1981, Ser. No. 295,499

Int. Cl.³ G01V *1/00*; H04B *13/00*

U.S. Cl. 367—154 **26 Claims**



1. A marine acoustical streamer section for an elongated acoustical streamer cable made up of plural sections connected serially together, the streamer section comprising an elongated streamer jacket of generally cylindrical tubular configuration of predetermined diameter including a bundle of signal wires and plurals strain wires extending through the interior thereof and connector couplers at opposite ends thereof adapted to be secured in mated relation without rotation to companion connector couplers of the same construction at the ends of adjacent streamer sections, each coupler comprising an axially elongated coupler body having a fully cylindrical anchoring head portion at an end thereof and an axially elongated half cylindrical segment portion extending integrally from said anchoring head portion having a distal end spaced from the latter, the half cylindrical segment portions of the companion couplers when secured in mating relation collectively forming a cylinder coaxial with said streamer jacket of a diameter substantially corresponding to the streamer jacket diameter, the coupler body defining a partially segmented tubular shell having a concave cavity extending through the length of said segment portion, said anchoring head portion including strain cable anchoring means and means for passing the bundle of signal wires therethrough, the insulator core assemblies removably received in said concave cavities having multiterminal electrical pin and socket type plug panels supported in the concave cavity of the associated coupler body to be disposed in confronting immediately adjacent parallelism with and connected to a mating multiterminal electrical plug panel of a companion coupler to be mated therewith, the insulator core assemblies for each coupler body having resilient means interposed between the core assembly and the surrounding coupler body and between its associated electrical plug panel and the panel-supporting portions of the associated core assembly disposing them in floating relation relative to the coupler body so that deformation of the stress carrying coupler body is not transmitted to its associated electrical plug panel, and assembly means adjacent to the ends of the half cylindrical segment portions of the coupler bodies remote from their anchoring head portions for securing the coupler bodies together with their half cylindrical segment portions mated together, said assembly means comprising a locking ring rotatably supported on the anchoring head portion of its associated coupler body for rotary movement about the axis of the coupler body between angularly spaced locking and unlocking positions and having an interlock portion disposed to overlap and interlock with the distal end portion of the elongated half cylindrical segment portion of the companion coupler when those coupler bodies are mated together and the locking ring is in the locking position.

4,500,981

JITTER COMPENSATION SYSTEM IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

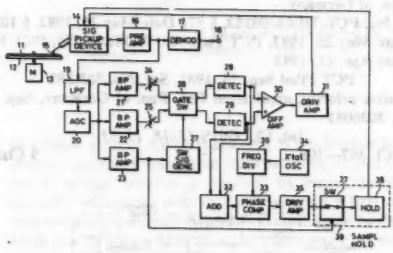
Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed May 26, 1982, Ser. No. 382,276

Claims priority, application Japan, Jun. 1, 1981, 56-84190

Int. Cl.³ G11B *21/02*

U.S. Cl. 369—43 **5 Claims**



1. A jitter compensation system in a rotary recording medium reproducing apparatus having a reproducing transducer including a reproducing element for reproducing recorded signals from a rotary recording medium, said rotary recording medium having recorded thereon an information signal and also recorded thereon reference signals for tracking control with a predetermined period, said reference signals for tracking control recorded on said rotary recording medium comprising first and second reference signals for tracking control, said first and second reference signals being changed over for each recorded track turn of the information signal on said rotary recording medium and alternately recorded between each track turn, said rotary recording medium also having recorded thereon a third reference signal for indicating the changeover of said first and second reference signals, said first and second reference signals not being recorded in an interval in which said third reference signals exists, said jitter compensation system comprising:

separation means for separating said reference signals from a signal reproduced by said reproducing transducer;

detection means for detecting the separated reference signals

and for obtaining at least one detection signal having a period which is dependent on a jitter;

standard signal supplying means for supplying a standard signal having a period equal to said predetermined period;

Phase comparing means for comparing means for comparing phases of said standard signal from said standard signal supplying means and at least one detection signal from said detection means, to produce a phase comparison error signal;

displacing means for displacing the reproducing element of said reproducing transducer along a relative scanning direction with respect to said rotary recording medium, in response to the output error signal of said phase comparing means; and

interrupting means responsive to the separated third reference signal, for interrupting the output of said phase comparing means during the interval in which said third reference signal exists.

4,500,982

SERVO CIRCUIT FOR A MOTOR FOR REPRODUCING A PCM AUDIO DISK

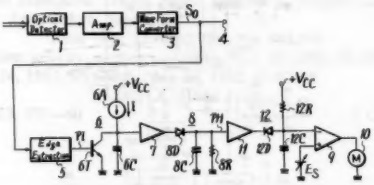
Tadao Yoshida, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 381,958, May 25, 1982, abandoned. This application May 1, 1984, Ser. No. 604,433

Claims priority, application Japan, May 29, 1981, 56-83028

Int. Cl.³ G11B *19/24*

U.S. Cl. 369—50 **5 Claims**



1. A servo circuit for driving a disk drive motor for a disk upon which a pulse code modulation signal with a run length limited code is recorded at a constant linear velocity comprising, an optical detector scanning said disk and producing a digital square wave output signal, a differentiating circuit receiving an output of said optical detector, and producing a pulse signal, a sawtooth signal producing circuit with a first time constant receiving the output of said differentiating circuit and the amplitude level of said sawtooth signal (SA) varying as a function of the output of said differentiating circuit, a maximum value holding circuit receiving the output of said sawtooth signal producing circuit, a first diode with one side connnected to the output of said maximum value holding circuit, a fixed voltage supply, a first resistor and a first capacitor connected between ground and said fixed voltage supply and the product of the resistance of said first resistor and the capacitance of said first capacitor being equal to a second time constant which is substantially more than said first time constant, an amplitude comparator connected to the second side of said first diode and to the junction point between said first resistor and first capacitor, a reference voltage source connected to said comparator, and said disk drive motor receiving the output of said comparator.

4,500,983

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

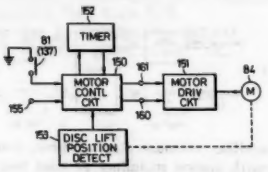
Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryozo Abe, both of Yokohama, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jul. 23, 1982, Ser. No. 401,321

Claims priority, application Japan, Jul. 28, 1981, 56-111838[U]

Int. Cl.³ G11B *19/10, 17/04*

U.S. Cl. 369—77.2 **5 Claims**



1. A rotary recording medium reproducing apparatus for reproducing a rotary recording medium accommodated within a case, said case comprising a jacket provided with a space for accommodating said rotary recording medium and an opening for allowing said rotary recording medium to go in and out of said jacket, and a lid member inserted through said opening of said jacket for closing said opening of said jacket, said rotary recording medium reproducing apparatus comprising:

an inserting opening through which said case is inserted;

a turntable for rotating said rotary recording medium;

lid member locking means and rotary recording medium clamping means respectively provided at an innermost part of said reproducing apparatus opposite to said inserting opening with respect to said turntable;

jacket opening enlarging means provided in the vicinity of said inserting opening, capable of moving over said turntable between a position in the vicinity of said inserting opening and said innermost part of said reproducing apparatus, in response to an operation in which said case is inserted into and pulled out from said reproducing apparatus;

a rotary recording medium supporting member provided at a center part of said turntable, capable of moving upwards and downwards independently of said turntable, for rising to support an inner peripheral part of said rotary recording medium so that said rotary recording medium is supported above said turntable;

a supporting member elevator mechanism for elevating said rotary recording medium supporting member, said supporting member elevator mechanism operating so that said rotary recording medium supporting member is in a raised state when said case or an empty jacket is inserted into said reproducing apparatus;

driving means for operating said supporting member elevator mechanism, said driving means operating in one direction to operate said supporting member elevator mechanism so that said rotary recording medium supporting member is raised, and operating in a reverse direction to operate said supporting member elevator mechanism so that said rotary recording medium supporting member is lowered;

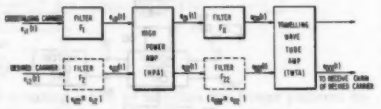
detecting means for detecting that said rotary recording medium supporting member is at the raised position; and

control means for controlling said driving means so as to operate in said reverse direction when said rotary recording medium supporting member is still at the raised position after a predetermined time period has elapsed from a time when said detecting means is operated.

4,500,984
EQUALIZER FOR REDUCING CROSSTALK BETWEEN TWO FDM/FM CARRIERS IN A SATELLITE COMMUNICATIONS SYSTEM

Osamu Shimbo, Bethesda, Md.; Lan N. Nguyen, Annandale, and Jack L. Dicks, Alexandria, both of Va., assignors to International Telecommunications Satellite Organization, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 427,097
Int. Cl.³ H04J *1/12*
U.S. Cl. 370—6 **6 Claims**

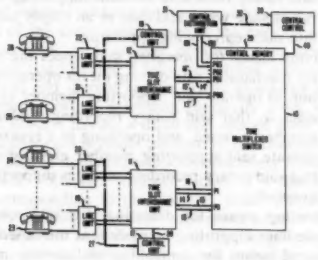


1. A satellite communications system, comprising: a transmitting earth station including at least two discrete carrier signal sources for producing two carrier signals, two modulators for individually modulating said two carrier signals and producing two modulated signals, modulator filter means for filtering said two modulator signals and producing two filtered signals, and a high power amplifier for amplifying said two filtered signals and transmitting two amplified signals, said high power amplifier having first non-linear transfer characteristics which produce intelligible crosstalk between said two transmitted amplified signals, and a receiving satellite including an input multiplex filter means for multiplexing said two transmitted amplified signals and producing two multiplexed signals, and a transponder travelling wave tube amplifier means for receiving said two multiplexed signals and producing two transponder output signals, said transponder travelling wave tube amplifier means having second non-linear transfer characteristics which produce intelligible crosstalk between said two transponder output signals, said modulator filter means of said transmitting earth station comprising an equalizer means for realizing a transfer function that takes into account the non-linearities of the high-power amplifier, the travelling wave tube amplifier and the responses of the input multiplexer filter, whereby said intelligible crosstalk between said two output signals is reduced under a first order approximation of the system.

4,500,985
COMMUNICATION PATH CONTINUITY VERIFICATION ARRANGEMENT

Shih-Jeh Chang, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 8, 1982, Ser. No. 447,878
Int. Cl.³ H04J *3/14*; H04M *3/22*
U.S. Cl. 370—14 **20 Claims**

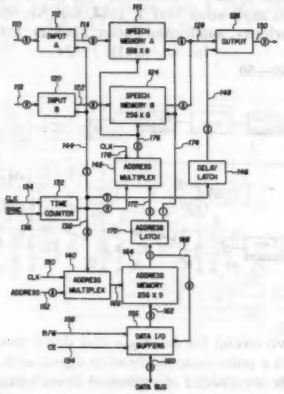


1. An arrangement comprising
switching means having an input port and an output port for selectively establishing a communication path between said input port and said output port,
a first communication unit connected to said input port,
a second communication unit connected to said output port,
means for generating a communication path identity signal defining said communication path and defining said first communication unit and
means for transmitting said communication path identity signal to said first communication unit and said second communication unit,
wherein said first communication unit comprises means responsive to said communication path identity signal for transmitting a source identification signal to said input port, said source identification signal defining said first communication unit and
wherein said second communication unit comprises means for receiving signals from said output port and means responsive to said communication path identity signal for generating an error signal when said source identification signal defining said first communication unit is not received from said output port by said second communication unit.

4,500,986
ASYMMETRICAL TIME DIVISION MATRIX APPARATUS

John H. Carver, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 31, 1983, Ser. No. 462,297
Int. Cl.³ H04J *3/04*
U.S. Cl. 370—58 **3 Claims**



1. Time division multiplex apparatus having time and space switching capability comprising, in combination:
first means for supplying N signal groups each signal group having M sets of time division multiplexed signals where N and M are both integers greater than 1;
signal memory second means including input means, output means and addressing control means having first and second (N * M) signal storage location sets where "*" is a multiplication symbol;
sequential addressing third means for providing sequentially occurring and repeating first address signals;
input buffer serial to parallel fourth means, connected to said first, second and third means, for supplying signals as received from said first means to said first and second signal storage locations of said second means at times determined by addressing signals received from said third means;
fifth means for supplying second address signals;
address memory sixth means, including address signal input

means, control means and output means, for storing (N * M) signal addresses wherein each signal address is (K+1) bits in length, where K is equal to $\log_2$ (N * M), at storage locations determined by signals applied at said control means thereof;

address memory multiplex seventh means, including clock input means, first and second address signal input and signal output means, and connected to said third, fifth and sixth means for supplying read and write addresses to said sixth means in accordance with clock signals supplied to said clock input means;

signal memory multiplex eighth means, including clock means, first and second address signal input means and signal output means, connected to said second, third and sixth means, for passing K addressing bits from said third and sixth means to each of said first and second signal storage location sets of said means;

ninth means connecting said sixth means to said second means for supplying the remaining addressing bit of said (K+1) bits in said sixth means to said first and second signal storage location sets in said second means;

parallel to serial output tenth means, including signal input, control input and N output means, connected to said second and third means for converting parallel signals from said first storage location set of said second means to serial output signals at one of said N output means in accordance with address signals received at said control means thereof from said third means; and

parallel to serial output eleventh means, including signal input, control input and N output means, connected to said second and third means for converting parallel signals from said second storage location set of said second means to serial output signals at one of said N output means in accordance with address signals received at said control means thereof from said third means.

4,500,987

LOOP TRANSMISSION SYSTEM

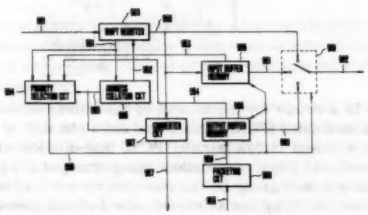
Satoshi Hasegawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1982, Ser. No. 443,876

Claims priority, application Japan, Nov. 24, 1981, 56-188118; May 24, 1982, 57-87485; May 24, 1982, 57-87486

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—60 **7 Claims**



1. In a loop transmission system of the type including a plurality of transmission/reception terminals and a control terminal which are connected in a loop so as to perform packet communications among respective transmission/reception terminals, the improvement wherein said control terminal includes means for periodically sending out a signal indicative of a leading position of a packet, and means for establishing a loop synchronization such that a transmission line delay created while the packet circulates once through the loop will be an integer multiple of a length of said packet, wherein there is provided means which gives a degree of priority to information signal from each of said transmission/reception terminals in accordance with the type of said information signal, and wherein said transmission/reception terminal comprises first accumulating means for storing and retiring an input packet from an input transmission line; second accumulating means for accumulating a transmission packet sent out from information generating means connected to said transmission/reception terminal, and means for comparing degrees of priorities of said input packet, a delayed packet and said transmission packet for sending out a packet having the highest degree of priority.

4,500,988

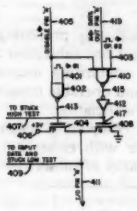
VLSI WIRED-OR DRIVER/RECEIVER CIRCUIT

Donald B. Bennett, Burnsville; Lee T. Thorsrud, Saint Paul, and Thomas W. Petschauer, Bloomington, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,803

Int. Cl.³ H03K *17/00*

U.S. Cl. 370—85 **15 Claims**



1. The method of driving a communications bus line connecting a plurality of driver/receiver elements, said communication bus line having inherent capacitance, said method comprising:

applying a first signal to said bus line during a first time interval from each and all of said driver/receiver elements in order to drive said bus line to a first voltage level representing a first logic state; and,

applying a second signal to said bus line during a second time interval from those ones of said driver/receiver elements which desire to drive said bus line to a second voltage level representing a second logic state, said second signal as applied from any one or ones of said driver/receiver elements which desire to drive said bus line to said second voltage level being sufficient to do so drive said bus line to said second voltage level;

wherein if none of those said ones of said driver/receiver elements do desire to drive said bus line to said second voltage level then said inherent capacitance of said bus line will maintain said bus line substantially at said first voltage level representing said first logical state for at least a portion of said second time interval.

4,500,989

DIGITAL COMMUNICATION SYSTEM

Ashraf M. Dahod, 21 Field Pond Dr., Reading, Mass. 01867

Filed Aug. 2, 1982, Ser. No. 404,039

Int. Cl.³ H04J *6/00;* **H04M** *11/04*

U.S. Cl. 370—85 **68 Claims**

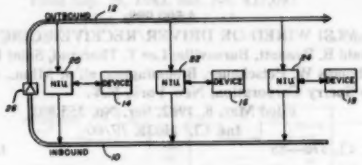
1. In a digital communication system having a signal communication network and a plurality of subscriber devices for transmitting information on, and receiving inforamtion from, said network in a plurality of variable-length information messages each having a start time, the improvement wherein said system comprises

means for associating with each subscriber device at least one message number selected from a group of message numbers which are sequentially numbered, and each one of said subscriber devices comprises,

means responsive to predetermined information in at least one of said messages for generating a message count indic-

ative of a message number associated with the message transmitted on said network at the time the count is generated, and

means responsive to the start times of messages on said network and responsive to said message count for transmitting a message on said netork a predetermined time interval after the start of the passage was transmitted on the network by the subscriber device associated with the



message number immediately preceding a message number associated with said one subscriber device,

said associating means comprising means associated with each subscriber unit and operable temporarily to perform said message number association,

said associating means comprising means for associating each message number with either only one subscriber device or with a plurality of subscriber devices.

4,500,990

DATA COMMUNICATION DEVICE INCLUDING CIRCUITRY RESPONSIVE TO AN OVERFLOW OF AN INPUT PACKET BUFFER FOR CAUSING A COLLISION

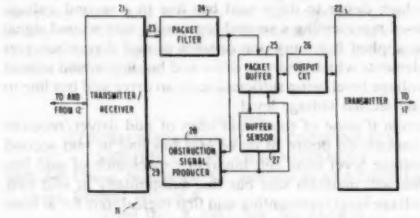
Fumio Akashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,675

Claims priority, application Japan, Apr. 14, 1982, 57-61896; Dec. 24, 1982, 57-231602

Int. Cl.³ H04Q 9/00

U.S. Cl. 370—85 **5 Claims**



1. A data communication device for use between a data processing device and a transmission medium of a data communication network including a plurality of transceivers by which said transmission medium is accessible by packets of digital signals, said network including collision detection, said packets including address parts by which said data communication device and said transceivers are identifiable, said data communication device comprising:

a receiver for receiving the digital signals from said transmission medium to produce received packets;

a packet buffer;

selecting means responsive to the address parts included in said received packets for selecting that one of said received packets as a selected packet which includes the address part for said data communication device, said selecting means thereby delivering said selected packet to said packet buffer to load said packet buffer with at least a portion of the selected packet delivered thereto;

packet delivering means coupled to said packet buffer for delivering the selected packet stored in said packet buffer to said data processing device;

sensing means coupled to said packet buffer for sensing whether or not said packet buffer is capable of storing an additional portion of the selected packet delivered thereto, said sensing means producing an overflow flag upon sensing that said packet buffer is not capable of storing said additional portion in addition to the portion already stored therein; and

obstruction signal transmitting means responsive to said overflow flag for transmitting an obstruction signal to said transmission medium, said obstruction signal causing a collision on said transmission medium.

4,500,991

CIRCUIT ARRANGEMENT FOR THE CONTROL OF THE TRANSMISSION OF DIGITAL SIGNALS, PARTICULARLY PCM-SIGNALS, BETWEEN STATIONS OF A TIME DIVISION MULTIPLEX TELECOMMUNICATION NETWORK PARTICULARLY PCM-TIME DIVISION MULTIPLEX TELECOMMUNICATION NETWORK

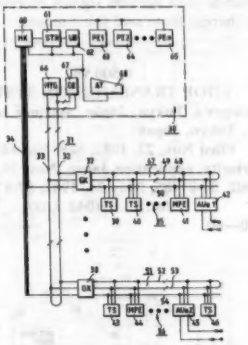
Hartmut Lubcke, and Martin Backhaus, both of Paderborn, Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Furstenallee, Fed. Rep. of Germany

Continuation of Ser. No. 140,872, Apr. 16, 1980, abandoned. This application Jun. 2, 1982, Ser. No. 384,275

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1979, 2915488

Int. Cl.³ H04J 3/06

U.S. Cl. 370—88 **4 Claims**



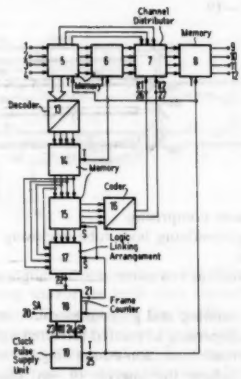
1. In a circuit for the control of the transmission of pulse code modulated (PCM) signals between a plurality of stations over a closed circuit parallel PCM time-division multiplex channel, said plurality of stations being arranged in a plurality of groups, each group being connected by a pair of transmitting and receiving trunks to said closed circuit time-division multiplex channel, said multiplex channel having a number of individual lines at least equal to the number of encoded bits of a PCM signal, each transmitting trunk of a pair connecting a group of stations to said multiplex channel through a plurality of individual transmitting lines connected to corresponding individual lines of said multiplex channel, and each receiving trunk of a pair connecting a plurality of individual receiving lines to corresponding individual lines of said multiplex channel, a central control system having an address control unit comprised of means for selectively connecting said pairs of trunks to said closed circuit time-division multiplex channel and disconnect means for selectively disconnecting at least the transmission trunk of any of said group of stations, a synchronizing signal generator, said closed circuit time-division multiplex channel and each receiving trunk of each group of stations having a single line for distribution of said synchronizing signal

to all connected stations, and a clock signal generator, said closed circuit time-division multiplex channel and each receiving trunk of each group of stations having a single line for distribution of said clock signal to all connected stations for synchronous time-division multiplex transmission and reception of signals by said stations over said closed circuit time-division multiplex channel during preassigned time slots.

4,500,992
SYNCHRONIZING ARRANGEMENT

Heinrich Fladerer, Planegg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,402
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1982, 3230027
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—100 **11 Claims**



1. An arrangement for synchronizing outgoing channels at the outputs of a demultiplexer by frame code words received as blocks in an incoming channel of a time-division multiplex system, comprising:

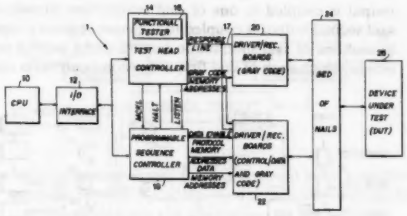
a transmission path including an input for receiving frame code words, an output for providing synchronized outgoing channels, a first memory connected to said input, a second memory connected to said first memory, a channel distributor connected to said second memory, and a third memory connected between said channel distributor and said output; and

a control path comprising a decoder connected to said first memory for decoding frame code words, a fourth memory connected to said decoder, a fifth memory connected to said fourth memory and including a switch through output, a logic linking arrangement connected to said fourth and fifth memories, for recognizing frame code words, a frame counter connected to said logic linking arrangement for counting frames and connected to said logic linking arrangement and to said fifth memory to cause switch through of a corresponding channel predetermined in response to the recognition of a number of frame code words, and a coder connected to said switch through output and to said channel distributor for causing synchronous distribution of the output channels via said third memory.

4,500,993
IN-CIRCUIT DIGITAL TESTER FOR TESTING MICROPROCESSOR BOARDS

Robert G. Jacobson, Brentwood, Calif., assignor to Zehntel, Inc., Walnut Creek, Calif.

Continuation-in-part of Ser. No. 160,562, Jun. 17, 1980, Pat. No. 4,339,819. This application May 19, 1982, Ser. No. 379,726
Int. Cl.³ G01R *31/28;* **G06F** *11/00*
U.S. Cl. 371—16 **24 Claims**



1. A circuit for use in an in-circuit digital tester for generating data bus and control input test signals to test electrical components of a circuit under test, the circuit-under-test having a plurality of data bus signal lines, the circuit comprising:

(a) a data memory responsive to data memory addresses for storing digital signals for generating data bus test signals in data signal sequences defined by a starting and a last data memory address, said stored signals for generating data bus test signals outputted in response to a predetermined sequence of data memory addresses;

(b) a control memory responsive to control memory addresses for storing digital signals for generating control test signals for a plurality of protocol control sequences in which each control sequence is defined by a plurality of control test signals generated in response to a predetermined sequence of control memory addresses, each control sequence having a starting and a last control memory address;

(c) a controller means, for generating the predetermined sequences of data and control memory addresses to generate selected ones of the control and data sequences, said controller means selectively enabling the generation of the data bus test signals in a data sequence during a selected control sequence; and

(d) a driver means associated with each said data and said control memory and responsive to the signal generating data from its associated memory, for generating the data bus and control sequence test signals, said driver means associated with said data memory outputting the data bus test signals when enabled by said controller means.

4,500,994
MULTI-RATE BRANCH METRIC PROCESSOR FOR MAXIMUM-LIKELIHOOD CONVOLUTIONAL DECODER

Ronald D. McCallister, Scottsdale, and James J. Crawford, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumberg, Ill.

Filed Oct. 4, 1982, Ser. No. 432,489
Int. Cl.³ G06F *11/12*
U.S. Cl. 371—43 **8 Claims**

6. In a maximum-likelihood convolutional decoder, a branch metric processor for generating branch metrics corresponding to base code rates of 1/X and 1/Y, where X>Y, comprising:

a first set of input registers comprising X registers each adapted to receive a soft-decision symbol;

a quantization input register adapted to receive an indication of a level of quantization of said symbols;

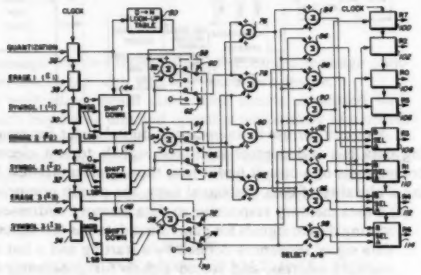
a second set of input registers comprising X registers each adapted to receive an erase control signal, each of said

registers in said second set being associated with a register in said first set;

means coupled to said quantization input register for producing a signal N equal to said level of quantization minus one;

a set of X subtraction circuits each coupled to one of said first set of input registers and to said signal N to produce a signal equal to N minus said symbol received by said one of said input registers;

a set of X switches having first and second outputs, each of said switches having a first position in which said first output is coupled to one of said subtraction circuits and said second output is coupled to the input register coupled to said one of said subtraction circuits and a second position in which each of said first and second outputs is equal



to zero, each of said switches being coupled to said input register in said second set which is associated with the input register coupled to said one of said subtraction circuits, whereby the erase control signal received by said input register determines the position of the switch;

summation means coupled to said outputs of said switches for producing a set of sums, each of said sums having a number of addends equal to X, said set of sums including all possible combinations of said outputs but excluding redundant combinations and combinations including two outputs from any one of said switches; and

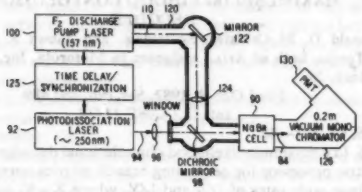
output means coupled to said summation means for outputting said sums as branch metrics, said output means being responsive to a select control signal to select the proper of said sums to correspond to one of said base code rates.

4,500,995

BROMINE ANTI-STOKES RAMAN LASER

Jonathan C. White, Lincroft, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 2, 1983, Ser. No. 490,783
Int. Cl.[3] H03F *7/00*
U.S. Cl. 372—3 **10 Claims**



1. An anti-Stokes Raman laser comprising:

a medium of molecules each of which contains at least one bromine atom, wherein said medium is chosen from the group consisting of:

(a) Br_2
(b) alkali bromides
(c) CH_3Br
(d) C_3F_7Br
(e) organo bromides
(f) Tl Br
(g) NaBr;

means for dissociating said at least one bromine atom from said molecules so that a majority of dissociated bromine atoms go into at least one excited metastable state; and

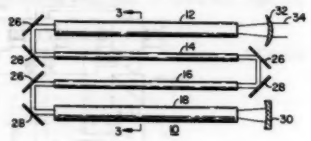
means for pumping said bromine atoms in said at least one metastable state with pump photons in order to provide anti-Stokes Raman output photons by transition from said metastable state to a final state, said output photons having energy equal to the pump photon energy plus an energy gain given by the energy difference between said metastable state and said final state.

4,500,996

HIGH POWER FUNDAMENTAL MODE LASER

Michael W. Sasnett, Los Altos; James L. Hobart, Los Altos Hills, and Larry A. Gibson, Redwood City, all of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Mar. 31, 1982, Ser. No. 363,843
Int. Cl.[3] H01S *3/03*
U.S. Cl. 372—19 **11 Claims**



1. A gas laser comprising:

a discharge-confining bore tube enclosing a gaseous lasing medium;

a pair of optical resonator mirrors aligned with said bore tube;

means for exciting said gaseous medium; and

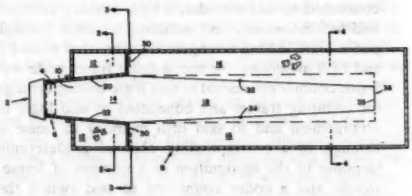
means for dispersing unwanted reflected light and providing desired mode operation comprising periodic annular projections within the interior of said discharge-confining bore tube, said annular projections having inside diameters which vary in accordance with the desired mode, as the mode diameter changes along said bore-tube.

4,500,997

CHEMICAL PUMP WITH INTEGRAL DIFFUSER

Gary F. Morr, Thousand Oaks, Calif., and William A. Duncan, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 1, 1982, Ser. No. 364,176
Int. Cl.[3] H01S *3/22*
U.S. Cl. 372—58 **9 Claims**



1. In a closed laser system including a chemical laser having

a gas storage and supply system, a self-contained device for pumping supersonic and subsonic gas flows comprising:

a. a chemically activated material capable of chemical reaction with the gas mixture being pumped;

b. thermal ballast material in a mixture with said chemically activated material;

c. a hermetically sealable vessel for containing said chemically active material;

d. said vessel being provided with internal surfaces to provide gas flow, said internal surfaces being geometrically prescribed to accept a supersonic gas flow, to induce a stable normal shock, to diffuse the subsonic flow obtained after the normal shock, and to distribute the low velocity, subsonic gas flow to the reactive chemical activated material.

4,500,998

GAS LASER

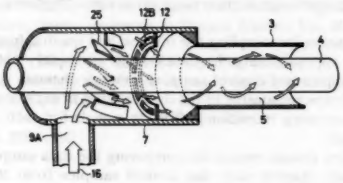
Kouji Kuwabara; Hiroyuki Sugawara, both of Hitachi; Toshiharu Shirakura, Tohkai; Yukio Kawakubo, and Kouji Sasaki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 410,955

Claims priority, application Japan, Sep. 9, 1981, 56-141022

Int. Cl.³ H01S *3/03*

U.S. Cl. 372—61 **10 Claims**



1. In a gas laser comprising; a discharge tube filled with a gas mixture and having mirrors at both ends thereof; electrodes disposed within said discharge tube for exciting the gas mixture; a cooling passage for introducing the gas mixture into said discharge tube through its one end and for exhausting the same from the other end of said discharge tube; and a heat exchanger for cooling the gas mixture and a blower for forcedly circulating it, both of which are disposed in said cooling passage,

an improved gas laser characterized in that said discharge tube has a double-tube construction comprising concentrically disposed inner and outer tubes, a tubular discharge space is formed between said inner and outer tubes, said cooling passage is connected to said discharge space a pair of mirror groups are disposed at both ends of said discharge space, each group comprising a plurality of mirrors arranged in a circumferential direction, and said pair of mirror groups are arranged in such a manner that a laser beam is reflected by said mirror pairs to repeatedly longitudinally traverse in said discharge space and each path of the laser beam between the corresponding mirror pairs in both said mirror groups obliquely intersects the central axis of said discharge space.

4,500,999

LINE EQUALIZER

Hiroshi Takatori, Kokubunji, and Toshiro Suzuki, Tama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,227

Claims priority, application Japan, Nov. 27, 1981, 56-189341

Int. Cl.³ H04B *3/14*

U.S. Cl. 375—16 **3 Claims**

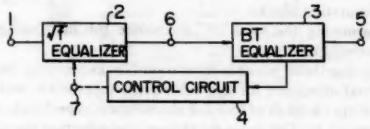
1. A line equalizer comprising:

a first equalizer for compensating a $\sqrt{f}$-characteristic of a transmission line;

a second equalizer having a subtractor for subtracting an echo component from the output of said first equalizer;

a decision circuit for discriminating code level of an equalized and coded signal outputted from said subtractor;

an equalization error detecting circuit for detecting an equalization error on the basis of the outputs from said subtractor and said decision circuit;



an echo detecting circuit for forming said echo component from the outputs of said decision circuit and said equalization error detecting circuit; and

a control circuit for controlling gain of said first equalizer on the basis of signals obtained in said decision circuit and said equalization error detecting circuit of said second equalizer.

4,501,000

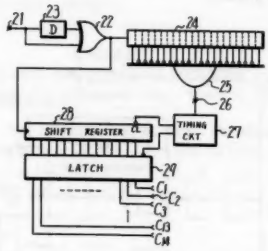
METHOD OF CODING BINARY DATA

Kornelis A. Immink; Jakob G. Nijboer, both of Eindhoven, Netherlands; Hiroshi Ogawa, and Kentaro Odaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 27, 1981, Ser. No. 286,982

Int. Cl.³ H03K *13/02*

U.S. Cl. 375—25 **13 Claims**



1. A method of encoding a binary digital signal, comprised of words of m bits, into a sequence of channel blocks each formed of an information block of n_1 serial bits followed by a separation block of a predetermined number of bits, where n_1 is greater than m, wherein, in a stream of such channel blocks, a d-constraint is satisfied such that consecutive bits of one type characterized by a transition are separated by at least d bits of another type characterized by an absence of a transition, and a k-constraint is satisfied such that no more than a maximum of k bits of the other type occur between successive bits of the one type, comprising the steps of:

receiving each word of m bits;

converting each such word into a corresponding information block of n_1 bits;

generating a set of possible separation blocks for use between successive information blocks so that said information and separation blocks together satisfy said d-constraint and said k-constraint;

initially forming a superblock of a plurality of successive information blocks catenated with respective possible

separation blocks, said superblock having a first information block therein;

determining the total DC imbalance for such initially formed superblock of said plurality of successive information words catenated with said respective possible separation blocks;

selecting for said initially formed superblock those possible separation blocks yielding the least total DC imbalance;

forming a subsequent superblock from said initially formed superblock, but excluding therefrom the first information block and separation block thereof, and from the next successive information block and another of said possible separation blocks;

determining the total DC imablance for such subsequent superblock;

selecting those possible separation blocks yielding the least total imbalance for said subsequent superblock; and

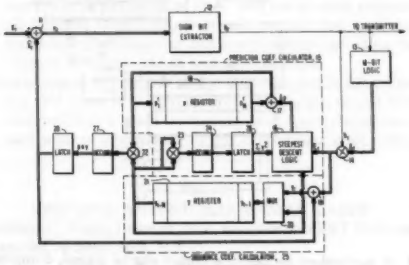
iterating the steps of forming a subsequent superblock, determining the DC imalance thereof and selecting the separation blocks therefor yielding the least total DC imbalance for the successive information blocks and associated separation blocks.

4,501,001

VARIABLE SLOPE DELTA CODING PROCESSOR USING ADAPTIVE PREDICTION

Krishnamoorthy Virupaksha, Rockville, and Samuel J. Campanella, Gaithersburg, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Nov. 4, 1982, Ser. No. 439,235
Int. Cl.³ H03K *13/22*
U.S. Cl. 375—30 **24 Claims**



1. A method for transmitting an input signal at a reduced bit rate, comprising the steps of:

determining a difference between an input signal and an estimate of said input signal;

transmitting as an output signal a sign bit of said difference;

providing an adaptive step size value in accordance with a predetermined number of sequential sign bits of said difference;

calculating a set of reconstructed signal values in accordance with sequential ones of said adaptive step size values and said estimate;

calculating a set of predictor coefficients in accordance with said reconstructed signal values and said sequential ones of said adaptive step size values; and

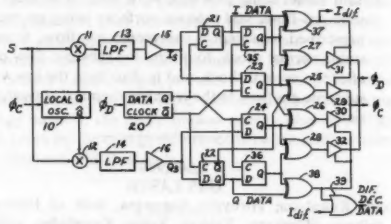
convolving said set of reconstructed signal values with said set of predictor coefficients to obtain a new value of said estimate.

4,501,002

OFFSET QPSK DEMODULATOR AND RECEIVER

Richard C. Auchterlonie, 5701 N. Sheridan #29-Q, Chicago, Ill. 60660

Filed Feb. 28, 1983, Ser. No. 470,053
Int. Cl.³ H04L *27/22*; H03D *3/02*
U.S. Cl. 375—86 **20 Claims**



12. In an offset QPSK demodulator receiving inphase and quadraphase signals in respective inphase and quadraphase channels and demodulating the signals to obtain data at a predetermined data rate, said inphase and quadraphase signals encoding respective inphase and quadraphase data streams having data transitions substantially offset from each other, a phase control signal generating apparatus comprising, in combination,

(a) means for sampling the inphase and quadraphase signals at approximately the data rate to alternately obtain data samples and control samples for each channel,

(b) means responsive to the data samples in each channel for generating transition-indicating signals for each channel, and

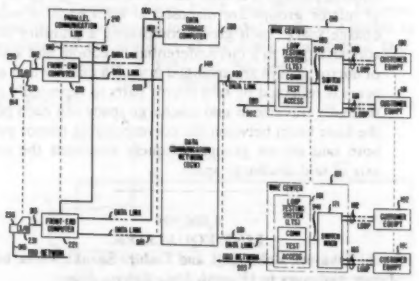
(c) first tristate means for comparing the data samples from each channel with the control samples from the other channel to generate a carrier phase control signal, said first tristate means being active in response to the transition-indicating signals.

4,501,003

DIAL PULSE MEASUREMENT CIRCUITRY

Hubert A. Miller, Manassas, Va., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,181
Int. Cl.³ H04M *3/22*
U.S. Cl. 375—94 **6 Claims**
MICROFICHE APPENDIX INCLUDED
(18 Microfiche, 1055 Pages)



1. A method for determining if a signal comprising a substantially rectangular wave degraded by interference has completed a transition from its first level to its second level and for estimating the time spent at said second level, said signal being

sampled at a rate significantly greater than the rate of said wave and the highest frequency of said interference to produce a sequence of samples and wherein each of said samples has been classified as a first level sample or a second level sample by comparison to a preselected threshold, said method comprising the steps of

(A) providing a monitor value initialized to said second level and a restart value initialized to said first level,

(B) monitoring said sequence for said monitor value and, upon detection, counting the number of samples generated until a predetermined number of consecutive samples have attained one of said levels, and once step (B) is entered from step (D), also incrementing an index until said number of consecutive samples have attained one of said levels,

(C) if said one of said levels is said restart value, returning to step (B), and

(D) if this step is entered for the first time, retaining the counted number of samples from step (B) as said index, interchanging said monitor value with said restart value and returning to step (B); otherwise, indicating the presence of said transition and providing said estimate in proportion to said index less said predetermined number.

4,501,004
DEVICE FOR ELIMINATING FM OR LIKE INTERFERENCE FROM A DIGITAL MICROWAVE SIGNAL

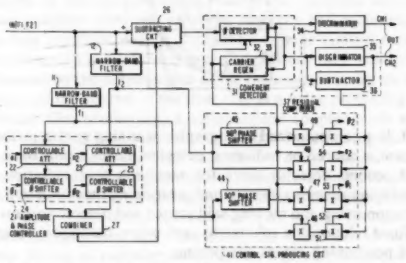
Yasuharu Yoshida; Hiroshi Seguchi, and Yoshimi Tagashira, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,961

Claims priority, application Japan, Jan. 30, 1982, 57-12544; Jan. 30, 1982, 57-12545

Int. Cl.³ H04B *1/12*

U.S. Cl. 375—102 **5 Claims**



1. An interference elimination device for use in a digital microwave communication system, said device being responsive to an intermediate frequency device input signal accompanied by an interference carrier component of a frequency modulation microwave communication system and operating at an intermediate frequency band, for substantially eliminating said interference carrier component and comprising:

narrow-band filter means for extracting said interference carrier component from said device input signal to provide an interference carrier component signal;

control means responsive to an amplitude and a phase control signal for amplitude and phase controlling said interference carrier component signal to produce an amplitude and phase controlled signal;

subtracting means for subtracting said amplitude and phase controlled signal from said device input signal to produce a difference signal including a residual interference component; and

control signal producing means responsive to said difference signal and said interference carrier component signal for producing said amplitude and said phase control signal.

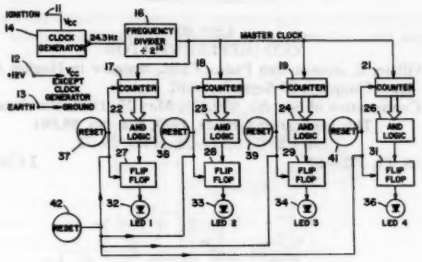
4,501,005
VEHICLE ELAPSED MILEAGE INDICATOR

Albert J. Miller, Campbell, Calif., assignor to Atlas Electronics International, Inc., Santa Clara, Calif.

Filed May 21, 1982, Ser. No. 380,913

Int. Cl.³ G04F *13/04*; G01R *23/10*

U.S. Cl. 377—20 **6 Claims**



1. In a vehicle having an engine operated by repetitive ignition pulses, a device for indicating required vehicle maintenance at predetermined elapsed time periods corresponding approximately to indicated mileage intervals, including clock generator means adapted to receive the vehicle engine ignition pulses and to generate output pulses in predetermined correspondence thereto, frequency divider means connected to said clock generator means for generating a master clock signal, a plurality of counters connected to said master clock signal, a plurality of logic gates, each connected to selected outputs of a respective one of said counters to produce an actuating signal at a predetermined count, and means connected to said logic gates for indicating that said predetermined count has been attained to thereby show said time for vehicle maintenance readable in approximate mileage.

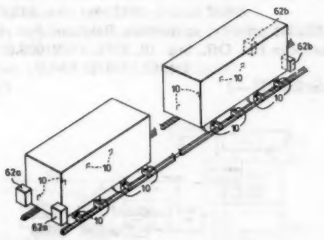
4,501,006
HOT-BOX SIGNALLING DEVICES

Michael Korenberg, 626 Algonquin Ave., Montreal, P.Q., Canada

Division of Ser. No. 178,189, Aug. 14, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 427,032

Int. Cl.³ H03K *5/13*

U.S. Cl. 377—45 **4 Claims**



1. A system for detecting a signal produced by a vehicle-mounted signalling device of the type adapted to expel a marker material in response to an abnormal condition sensed by said device, the system comprising:

a first detector adapted to be mounted at a forward position on the vehicle in front of all of said signalling devices carried, by the vehicle;

a second detector adapted to be mounted at a rear position on the vehicle behind all of the said signalling devices;

each of said detectors being adapted to detect and respond to

the presence of said marker material expelled by one of said signalling devices, and thereupon produce a signal; and,

comparator means to which said detectors are connected, said comparator means being adapted to produce an output signal only when an input signal is received from said second detector without being preceded by a corresponding input signal from said first detector.

4,501,007

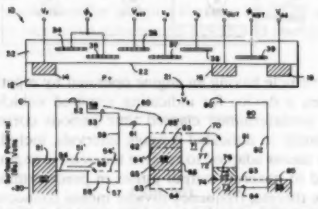
CCD DIFFERENTIATOR

William E. Jensen, San Pedro, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 909,329, May 25, 1978, abandoned. This application Oct. 29, 1979, Ser. No. 88,801

Int. Cl.³ G11C *19/28*; H01L *29/78*

U.S. Cl. 377—60 **2 Claims**



1. A charge coupled device for differentiating an input signal, comprising:

means for providing a potential well for storing charge;

means for periodically generating a charge packet of fixed value and for applying said charge packet to said well;

means for changing the capacity of said well in response to said input signal such that the change in capacity of said well corresponds to the change in potential of said input signal; and

means for providing an output signal representative of the change in capacity of said well.

4,501,008

DEVICE FOR ELECTRONICALLY CONTROLLING LOOM COMPONENTS

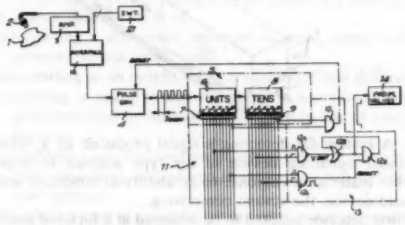
Henri J. Rosseel, Ieper, and Filip N. Deconinck, Zwevegem, both of Belgium, assignors to N.V. Weefautomaten Picanol, Belgium

Filed Jun. 4, 1982, Ser. No. 385,078

Claims priority, application Belgium, Jun. 17, 1981, 59214; European Pat. Off., Sep. 10, 1981, 81201008.0

Int. Cl.³ D03D *51/00*

U.S. Cl. 377—2 **5 Claims**



1. A device for generating electronic control signals for a pneumatic projecting loom comprising:

a mechanical cam lobe driven in synchronism with the crankshaft of said loom,

a detecting means for producing an enabling pulse only when cooperating with said cam lobe,

a pulse generator which is connected to said detecting means for producing a series of digital pulses of adjustably variable frequency only when cyclically enabled by said detecting means,

a number of series-connected decade pulse counters, whose first counter is series-connected to said pulse generator and whose parallel output pin-selectable conductors form the vertical components of a conductor matrix, the horizontal components of which are in turn formed from a pin-selectable number of conductors comprising the inputs of a pre-determined group of digital logic gates whereby a set of logic signals from said gates operate a set of control/drive circuits connected directly to the loom components to thus control specific cyclic events in said loom by the pin-selected values designated in said conductor matrix.

4,501,009

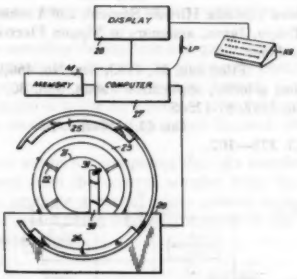
APPARATUS FOR STEREOTACTIC SURGERY

Manlio Abele, Garden City, N.Y., assignor to New York University, New York, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,526

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—19 **17 Claims**



1. In a computerized tomographic scanning system including a base, a source or radiation, detector means comprising first and second detector units for receiving said radiation and producing scanning signals, and positioning means on said base for supporting and moving said source and detector means in a defined relationship relative to each other, the improvement in said positioning means comprising:

(a) a generally C-shaped frame having upper and lower arms,

(b) means for securing said source to said upper arm and means for movably arranging said first and second detector units along a predetermined portion of said lower arm, said predetermined portion being disposed circumferentially opposite said source,

(c) first drive means for rotating said frame about a nominally horizontal axis Z, thereby rotating said source and said predetermined portion of said lower arm in the same direction about a circumferential path, with the rotation of said beam defining a basic radiation scan plane,

(d) second drive means for moving said frame along said Z axis for scanning in planes parallel to said basic plane and axially spaced along said Z axis, and

(e) third drive means on said frame for moving said detector means circumferentially along said predetermined portion of said lower arm, particularly for moving said first and second detector units together, one leading the other, in the same circumferential direction as said source for a first predetermined distance and moving the leading one of said detector units in the opposite direction for a second

predetermined distance after each movement of said detector units together for said first predetermined distance, while said radiation beam is projected between said source and said detector means such that at all times said beam impinges on at least one of said detector units.

4,501,010

DENTAL X-RAY DIAGNOSTIC INSTALLATION

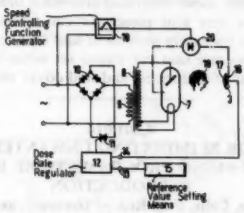
Ulrich Grassme, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,445

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143157

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—38 **1 Claim**



1. A dental X-ray diagnostic installation comprising an exposure unit including an X-ray tube and a cassette holder, movable about a head location lying between the X-ray tube and the cassette holder for producing general exposures, a radiation detector which supplies an electrical output signal corresponding to the dose rate when it is struck by X-radiation being attached to the cassette holder, automatic exposure control means coupled with said radiation detector and including a dose rate regulator and an X-ray tube voltage control means interconnected in such manner that the X-ray tube voltage is influenced by the output signal of the radiation detector for the purpose of the control of the dose rate to a value producing an optimum film blackening, a single motor coupled with said X-ray tube and with said cassette holder for effecting movement thereof about the head location for the production of a general exposure during an exposure operation, and a function generator coupled with said single motor, said function generator storing respectively optimum velocity curves for various patient constitutions and controlling the speed of the single motor during an exposure operation for a given patient constitution such that the radiation dose influencing successive locations of an X-ray film in the cassette holder is approximately constant for the given patient constitution, and such that the dose rate regulator is only required to vary the radiation output from the X-ray tube within a relatively small range in comparison to the range which would be required in the absence of control of the speed of said single motor by said function generator.

4,501,011

ANGULATING LATERAL FLUOROSCOPIC SUSPENSION

Robert B. Hauck, Delafield, and Larry Susami, Wauwatosa, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 22, 1982, Ser. No. 421,603

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—196 **23 Claims**

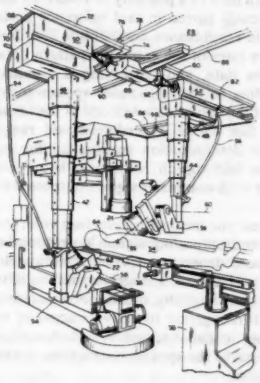
1. A diagnostic x-ray machine for being mounted to a support to conduct fluoroscopic examinations with x-rays passing through an isocenter, said machine comprising:

an x-ray source for emitting a pattern of x-rays disposed about a central ray;

an x-ray source carriage for supporting said x-ray source, wherein said source carriage is supported by said support and mounted for pivoting said x-ray source about a first axis and for translating said x-ray source in a first plane perpendicular to said first axis;

an x-ray detector for receiving a pattern of x-rays from said source;

an x-ray detector carriage for supporting said x-ray detector, wherein said detector carriage is supported by said support and mounted for pivoting said x-ray detector about a second axis parallel to said first axis and for translating said x-ray detector in a second plane perpendicular to said second axis; and



a bridge pivotally secured to said support for rotation about a third axis which is parallel to said first and second axes and passes through said isocenter, said bridge including coupling means for linking said x-ray source carriage and said x-ray detector carriage in such a way as to allow said x-ray source and x-ray detector to be maintained in diametric opposition with respect to said isocenter.

4,501,012

SPEECH RECOGNITION SYSTEM FOR AN AUTOMOTIVE VEHICLE

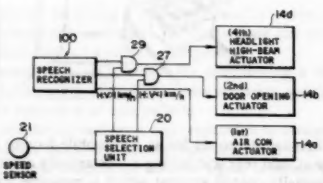
Norimasa Kishi, and Kazunori Noso, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 18, 1982, Ser. No. 379,506

Claims priority, application Japan, Nov. 17, 1980, 55-161605; Nov. 21, 1980, 55-164359

Int. Cl.³ G10L *1/00*; E05B *49/00*

U.S. Cl. 381—43 **14 Claims**



1. A speech recognition system for an automotive vehicle for outputting a plurality of command signals to a plurality of vehicle actuators independently in accordance with spoken instructions, which comprises:

(a) at least one microphone for transducing spoken instruc-

tions into corresponding electric signals and outputting signals corresponding thereto;

(b) a speech recognizer including a parameter extraction section, at least one reference pattern memory unit, a resemblance comparator, a resemblance determination section, and a controller, said speech recognizer being connected to said at least one microphone for extracting time-series matrix-phonetic pattern data from the transduced spoken instruction signals by said parameter extraction section, sequentially comparing the extracted matrix-phonetic pattern data with the reference matrix-phonetic pattern data of a plurality of reference spoken instructions previously stored in said reference pattern memory unit by said resemblance comparator in order to obtain resemblance rates of the extracted pattern data to the reference pattern data, and outputting a command signal corresponding to the transduced spoken instruction signals to one of the actuators when one of the obtained resemblance rates lies within a predetermined range in said resemblance determination section, all the mutual operations within said speech recognizer being executed in accordance with command signals outputted from said controller,

(c) at least one means for detecting vehicle-travelling conditions and outputting signals corresponding thereto; and

(d) a speed-dependent speech selection unit connected to both said speech recognizer and said vehicle-travelling condition detecting means for selectively allowing said speech recognizer to activate some of the actuators, according to the detected vehicle-travelling conditions, in response to the spoken instructions corresponding to the actuators,

whereby it is possible to prevent actuator operations due to said speech recognizer which would be inappropriate for the current vehicle speed.

4,501,013

CAR STEREO SET

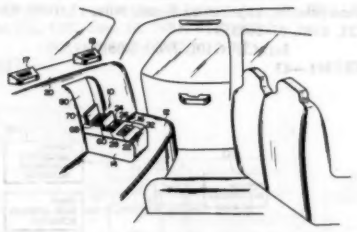
Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1980, Ser. No. 185,804

Claims priority, application Japan, Sep. 18, 1979, 54-119720; Sep. 18, 1979, 54-119721; Sep. 18, 1979, 54-119722; Sep. 18, 1979, 54-119724; Sep. 18, 1979, 54-119725; Sep. 18, 1979, 54-119726; Sep. 18, 1979, 54-119727; Sep. 18, 1979, 54-119728; Sep. 18, 1979, 54-119729; Sep. 18, 1979, 54-119730; Sep. 18, 1979, 54-119731; Sep. 18, 1979, 54-119732

Int. Cl.³ H04R *5/00, 1/00*

U.S. Cl. 381—86 **14 Claims**



1. In a car stereo set for an automobile having a front and a rear seat, said rear seat having a substantially central recess and substantially central armrest which is movable into and out of said recess of said rear seat, said substantially central armrest having a portion which is selectively hidden from view when said armrest is in said recess of said rear seat, said armrest portion having an upper surface directed toward the ceiling of the automobile when said armrest is out of said recess of said rear seat,

the improvement comprising:

a car stereo set installed in said armrest, said stereo set comprising a portion having control knobs and a tape recorder mechanism having an operating portion incluidng a cassette loading chamber, said control knobs and cassette loading chamber being exposed on said upper surface of said portion of said armrest;

at least one openable cover means covering both said portion having said control knobs and said operating portion of said tape recorder mechanism, including said cassette loading chamber, said cover means presenting a flat surface, free of projecting knobs, at said upper surface of said armrest when said cover means is closed, said cover means permitting access to said control knobs and cassette loading chamber when opened;

wherein said car stereo set including said control knobs and operating portion of said tape recorder mechanism is hidden from view when said armrest is in said recess, and wherein a rear seat passenger can access said control knobs and operating portion of said tape recorder mechanism to operate said car stereo set when said armrest is moved out of said recess and said cover means is opened.

4,501,014

METHOD FOR ELIMINATING UNWANTED ACOUSTIC SIGNALS IN AUDIO PROGRAMS TO BE EDITED FOR REPRODUCTION

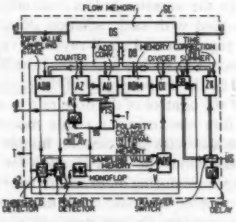
Björn Blüthgen, Celle, Fed. Rep. of Germany, assignor to Polygram GmbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 285,546, Jul. 21, 1981, abandoned. This application Jan. 12, 1984, Ser. No. 570,413

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028334

Int. Cl.³ G11B *3/00*

U.S. Cl. 381—94 **5 Claims**



1. A method for suppressing unwanted acoustical signals in audio programs to be edited for reproduction, if unwanted signals occur, and for connecting audio signals immediately preceding and following said unwanted signals, such unwanted acoustical signals including abrupt signal level discontinuities, comprising the steps of:

storing predetermined values in memory corresponding to amplitudes of transition signals, detecting a signal level discontinuity, sampling an audio signal of said audio program between successive signal flow/polarity changes in such signal, preceding and following the detected discontinuity, to produce a plurality of sample values between said two successive signal flow/polarity changes, reading said predetermined stored values corresponding to amplitudes of transition signals and manifesting the same as a plurality of equally distributed values corresponding to a transfer function forming smooth transitions with said preceding and following audio signals; modifying the amplitudes of the said values read from said memory in accordance with the amplitude change between the preceding and following audio signals; whereby said modified values correspond to a transfer function smoothly connecting the preceding and following audio signals; delaying the sampled audio signals, and inserting, when a

said discontinuity is detected, the modified values into the delayed audio signals, whereby the sample values between said two signal flow/polarity changes in the region of a discontinuity are replaced with transition signals having a smooth transition with respect to the preceding and succeeding audio signals, said transition signals being matched to the time interval between the signal flow/-polarity changes.

4,501,015
APPARATUS FOR ELECTROACOUSTIC ENERGY CONVERSION

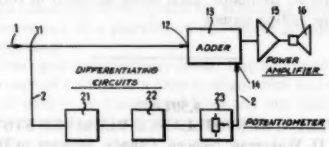
Jacobus C. van Dijk, Gouvernestraat 134 b, Rotterdam, and Erik von Michalofski, Planetenlaan 408, 3318 JS Dordrecht, both of Netherlands

Filed Aug. 23, 1982, Ser. No. 410,677

Claims priority, application Netherlands, Sep. 4, 1981, 8104108

Int. Cl.³ H04R *3/04*

U.S. Cl. 381—103 **9 Claims**



1. An apparatus for electroacoustical energy conversion comprising:

(a) a first channel for receiving an electrical input signal, said first channel including:

(i) a signal adder means having a first input supplied with said input signal and an output for supplying a first output signal;

(ii) a power amplifier for amplifying said first output signal; and

(iii) an electroacoustic transducer connected to an output of said power amplifier; and

(b) a second channel for receiving a portion of said input signal, said second channel including signal front edge slope sensing means for sensing the front edge slope of said input signal, said slope sensing means providing, only at frequencies above at least 50 kHz, a second output signal to a second input of said signal adder means, whereby said first output signal supplied to said power amplifier represents a sum of said input signal and said second output signal.

4,501,016
DEVICE FOR THE DYNAMIC ADJUSTMENT OF A BLACK/WHITE DISCRIMINATION THRESHOLD FOR THE PROCESSING OF IMAGES CONTAINING GREY VALUES

Eric H. J. Persoon, Eindhoven, Netherlands, and Ratnayake M. S. S. Abeysekera, Nugegoda, , assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,768

Claims priority, application Netherlands, Nov. 20, 1981, 8105256

Int. Cl.³ G06K *9/48*

U.S. Cl. 382—22 **10 Claims**

1. A device for the dynamic adjustment of a black/white discrimination threshold for the processing of images which are composed of a matrix of pixels which each contain a grey value and which are arranged in rows and columns of the matrix, said device comprising:

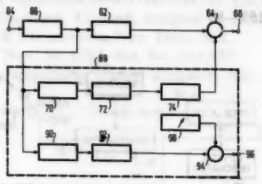
a. a first input (**60**) for receiving the grey values;

b. a threshold generator (**68**) which comprises:

b1. first means (**72, 74**) for receiving the grey values of a first sequence of first local sub-sets of pixels and for determining for each first local sub-set a local black/white threshold for presentation on a first output;

c. a discriminator (**64**) for presenting alternatively a black or a white signal on a second output (**66**) by comparison of the grey value of a pixel with the local black/white threshold applicable to the relevant pixel, characterized in that the threshold generator comprises:

b2. an edge detector which comprises a second input which is connected to said first input in order to receive the grey values of a second sequence of second local sub-sets of



pixels for the detection of a local edge between darker pixels and lighter pixels, thus forming an accept signal on a third output (**82**), but forming a reject signal on the third output in the absence of such a local edge;

there are also being provided:

d. time control means (**62**) for presenting a black/white signl of a pixel, on the basis of a first local sub-set of pixels to the second output together with the accept/reject signal on the third output which has been generated on the basis of a second local sub-set of pixels associated with said first local sub-set of pixels.

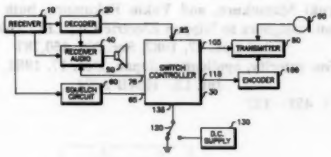
4,501,017
SWITCH CONTROLLER FOR OBTAINING A PLURALITY OF FUNCTIONS FROM A SINGLE SWITCH IN A TWO-WAY TRANSCEIVER AND METHOD THEREFOR

Mary L. Higgins, and David L. Muri, both of Sunrise, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 31, 1983, Ser. No. 462,486

Int. Cl.³ H04B *1/44, 1/02;* **H04Q** *7/00*

U.S. Cl. 455—78 **31 Claims**



1. In a transceiver including a transmitter and a receiver, a multiple function switch controller for controlling the transceiver by the operation of a switch, comprising:

a timer responsive to said switch for establishing a time interval, the duration of said time interval being independent of the operation of said switch;

first means, coupled to said timer and responsive to actuation of said switch occuring during said time interval, for producing a first transceiver control signal wherein said first control signal establishes a first operational mode for said transceiver; and

second means, coupled to said timer and responsive to actuation of said switch occuring outside of said time interval, for producing a second transceiver control signal wherein said second control signal establishes a second operational mode for said transceiver;

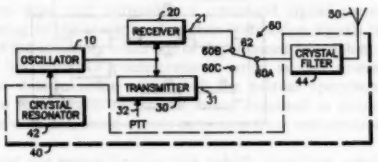
whereby, said switch controller allows said switch to control a plurality of transceiver functions.

4,501,018

SIMPLEX TRANSCEIVER EMPLOYING A COMMON PIEZOELECTRIC ELEMENT FOR TRANSMITTING AND RECEIVING

Charles W. Shanley, Plantation, and William V. Braun, Pompano Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1983, Ser. No. 511,024
Int. Cl.³ H04B *1/44, 1/54*
U.S. Cl. 455—83 **22 Claims**



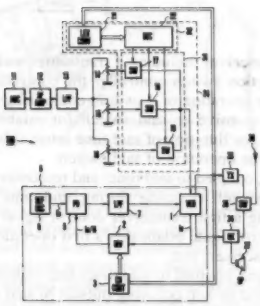
1. A radio frequency transceiver comprising:
radio frequency receiver means for receiving input signals at a first predetermined frequency;
radio frequency transmitter means for generating output signals at said first predetermined frequency;
oscillator means, coupled to each of said transmitter means and said receiver means, for generating signals which control the frequency on which said receiver means receives and said transmitter means transmits;
piezoelectric resonator means, coupled to said oscillator means, for controlling the frequency of the signals generated thereby;
piezoelectric filter means, selectively coupled to said receiver and transmitter means, for filtering input signals provided to said receiver means and for filtering output signals generated by said transmitter means,
said piezoelectric resonator means and said piezoelectic filter means each operating at or near said first predetermined frequency.

4,501,019

FREQUENCY MODULATION TRANSMITTER

Masayuki Matsukura, and Yukio Fukumura, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1982, Ser. No. 450,787
Claims priority, application Japan, Dec. 17, 1981, 56-204979
Int. Cl.³ H04B *1/04*
U.S. Cl. 455—112 **1 Claim**



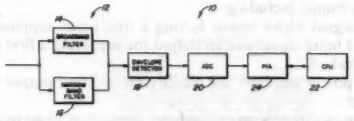
1. In a frequency modulation transmitter comprising: a transmitter section; a frequency synthesizer for operating the transmitter section including a loop connection of a voltage controlled oscillator, a frequency divider for frequency dividing the output signal of the voltage controlled oscillator and a comparator for comparing the output signal of the frequency divider with a reference frequency signal, and a channel controller for generating channel designation information for setting the frequency division ratio of the frequency divider; means for applying a modulation input signal to the voltage controlled oscillator; and switch means for setting the level of the modulation input signal according to the frequency division ratio of the frequency divider as set by the channel controller, said level setting means comprises: means, responsive to the channel designation information of said channel controller, for generating code signals representative of a plurality of sub-frequency bands within a transmission frequency band in use; means for decoding the code signals to generate corresponding analog signals; a plurality of means, connected to said modulation input signal applying means, for changing the level of the modulation input signal; and a plurality of switches, each connected between each level changing means and said voltage controlled oscillator, each being actuated in response to each of the analog signals.

4,501,020

SPECTRUM SURVEILLANCE RECEIVER SYSTEM

Philip E. D. Wakeman, Nepean, Canada, assignor to Her Majesty in Right of Canada, Canada

Filed Sep. 21, 1982, Ser. No. 420,894
Int. Cl.³ H04B *17/00*
U.S. Cl. 455—226 **13 Claims**



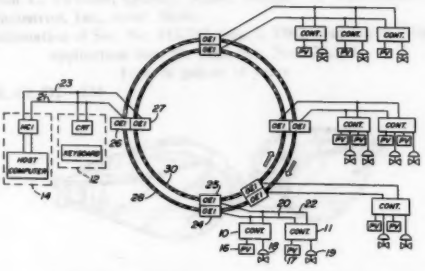
7. A spectrum surveillance apparatus for surveilling signals within a predetermined RF band and identifying at least the type of modulation of signals within said band, said apparatus comprising:
a receiver adapted to receive RF signals at a variable reception frequency within said RF band and convert any signal at that frequency to an IF signal having a predetermined IF;
first sampling means for sampling the IF envelope of said IF signal;
second sampling means for sampling said IF signal and providing AM, FM and DSB lock indication and modulation indication outputs;
means responsive to said first and second sampling means for providing signals representative of at least the variance and the percentage of said first sample means samples having at least one predetermined amplitude and signals representative of the percentage of the samples of said second sampling means which are indicative of a condition of lock and modulation;
comparator means for comparing said signals of said responsive means against predetermined sets of reference values, each set being distinctive of a particular modulation type, and providing a first output indicative of the type of modulation of said signal when said responsive means signals substantially match the reference values of said modulation type and a second signal indicative of an unidentified signal when said responsive means signals do not match any of said sets of reference values.

4,501,021

FIBER OPTIC DATA HIGHWAY

Edward L. Weiss, Quakertown, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed May 3, 1982, Ser. No. 373,916
Int. Cl.³ H04B 9/00
U.S. Cl. 455—601 **4 Claims**



4. A data communications system for providing communications between any of a plurality of stations or groups of stations, comprising:

a first fiber optic data highway connecting all of said stations or groups of stations in a loop configuration and enabling optical data to be transmitted from any one station completely around said loop for reception by a selected other station;

a second fiber optic data highway providing a redundant connection of all of said stations or groups of stations in a similar loop configuration enabling the exact same optical data to be transmitted from said one station to said selected other station in a direction opposite to that of said first highway;

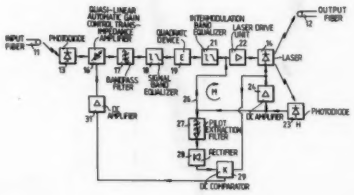
optical electrical interface means connecting each of said stations to said first and second loops, said interface means each having a first transmitter-receiver in series in said first highway and a second transmitter-receiver in series in said second highway so that data signals are propagated completely around both of said highways and received by the transmitting station to provide a check on the continuity of said highways, said interface means also including means for disconnecting the transmitters associated with the transmitting station from the receivers associated with that station so that the propagation of said data signals does not continue around the loops more than once.

4,501,022

OPTICAL TRANSMISSION SYSTEM AND METHOD

Thomas Oswald, Dartford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,623
Claims priority, application United Kingdom, Dec. 3, 1981, 8136508
Int. Cl.³ H04B 9/00
U.S. Cl. 455—601 **29 Claims**



1. A method of optical transmission of an analog signal whose statistical properties approximate "white noise", said analog signal having a mean signal value and being transmitted by a repeater having a minimum threshold signal value comprising the step of increasing said mean signal value when the peak value of said analog signal is equal to or exceeds the difference between said mean signal value and said minimum threshold signal value.

completely around both of said highways and received by the transmitting station to provide a check on the continuity of said highways, said interface means also including means for disconnecting the transmitters associated with the transmitting station from the respective associated highways such that the propagation of said data signals does not continue around the loops more than once.

4,501,022

OPTICAL TRANSMISSION SYSTEM AND METHOD

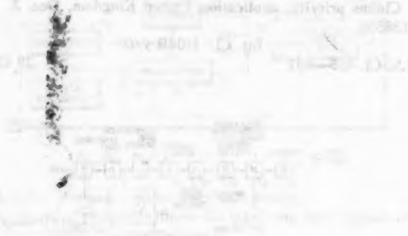
Thomas Dawall, Dartford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,623

Claims priority, application United Kingdom, Dec. 2, 1981, 8136530

Int. Cl.[3] H04B 9/00

U.S. Cl. 455—617 20 Claims



1. A method of optical transmission of an analog signal whose spectral properties extend into the zero frequency region and a signal having a mean signal level and binary signal derived by a reconstruction to a continuous analog signal by a computing the steps of generating said binary signal, thereafter modulating the pulse states of said analog signal to operate said optical transmitter.

4,501,023

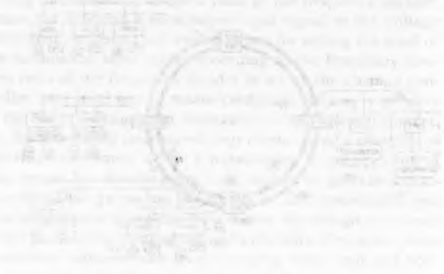
FIBER OPTIC DATA HIGHWAY

Edward L. Weiss, Doylestown, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed May 3, 1982, Ser. No. 375,016

Int. Cl.[3] H04B 9/00

U.S. Cl. 455—601 4 Claims



1. A data communication system for providing communications between any of a plurality of stations or groups of stations comprising:

a first fiber optic data highway interconnecting all of said stations or groups of stations in a loop configuration and enabling optical data to be transmitted from any one station to the others in said loop in one direction in a serial manner;

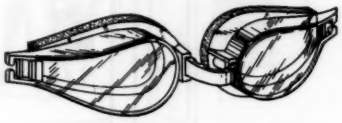
a second fiber optic data highway interconnecting all of said stations or groups of stations in a similar loop configuration enabling the same optical data to be transmitted from said one station around said loop to said other stations in a direction opposite to that of said first highway;

optical electrical interface means interfacing each of said stations to said first and second loops, said interface means each having a first transmitter-receiver in series in said first highway and a second transmitter-receiver in series in said second highway so that data signals are propagated

DESIGNS

FEBRUARY 19, 1985

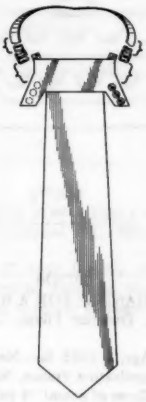
277,614
SWIM GOGGLES
Simon C. Fireman, Quincy, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Continuation of Ser. No. 413,733, Sep. 1, 1982, abandoned. This application Sep. 30, 1982, Ser. No. 429,283
Term of patent 14 years
U.S. Cl. D2—234



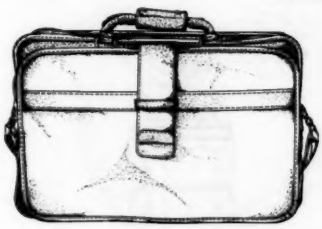
277,615
POCKETED BOOT
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Mar. 12, 1982, Ser. No. 357,487
Term of patent 14 years
U.S. Cl. D2—274

277,616
ATHLETIC SHOE WITH COUNTER POCKET
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Oct. 8, 1982, Ser. No. 433,462
Term of patent 14 years
U.S. Cl. D2—309

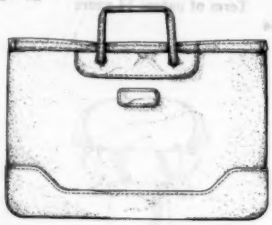
277,617
NECKTIE
Cheng C. Chen, 2-6th Fl., 13, La. 118, Chung Ching S. Rd. Sec. 1, Taipei, Taiwan
Filed Apr. 23, 1982, Ser. No. 371,347
Term of patent 14 years
U.S. Cl. D2—354



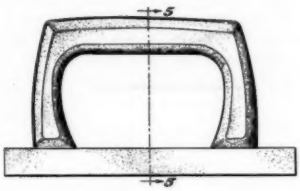
277,618
CARRY-ON LUGGAGE
Harvey J. Bomes, Wellesey, Mass.; John J. Migliore, Barrington, R.I.; John Pulichino, Wellesey, and Jack Barber, Cambridge, both of Mass., assignors to American Tourister, Inc., Warren, R.I.
Filed Jan. 18, 1983, Ser. No. 458,952
Term of patent 14 years
U.S. Cl. D3—71



277,619
PORTFOLIO CASE
Harvey J. Bomes, Wellesey, Mass.; John J. Migliore, Barrington, R.I.; John Pulichino, Wellesey, and Jack Barber, Cambridge, both of Mass., assignors to American Tourister, Inc., Warren, R.I.
Filed Jan. 18, 1983, Ser. No. 458,953
Term of patent 14 years
U.S. Cl. D3—71

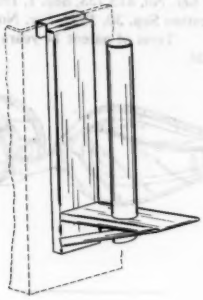


277,620
HANDLE FOR A BAG
Maxime Parrochia, Quartier l'llate, La Verpilliere, 38290, France
Filed Apr. 1, 1982, Ser. No. 364,284
Claims priority, application France, Nov. 23, 1981, 81 4023
Term of patent 14 years
U.S. Cl. D3—54

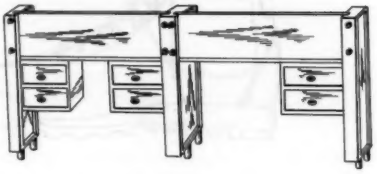


277,621
CHAIR
Anthony F. Albanese, Upper Montclair, N.J., assignor to I.P.F. International, Inc., Paterson, N.J.
Filed Dec. 16, 1982, Ser. No. 450,233
Term of patent 14 years
U.S. Cl. D6—334

277,622
BATHROOM TISSUE HOLDER
Robert Servadio, 3721 Parkview Ave., Pittsburgh, Pa. 15213
Filed Mar. 23, 1983, Ser. No. 477,919
Term of patent 14 years
U.S. Cl. D6—520

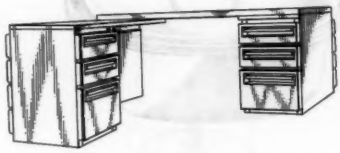


277,623
CABINET UNIT FOR LAVATORY BASINS
James J. Palka, Arlington Heights, Ill., assignor to Pace Industries Inc., Chicago, Ill.
Filed Apr. 22, 1982, Ser. No. 370,944
Term of patent 14 years
U.S. Cl. D6—423



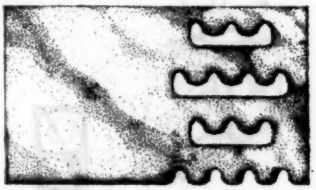
277,624
MAIL EXTRACTING AND SORTING DESK
Albert F. Stevens, Moorestown, and Paul E. Haley, Hammonton, both of N.J., assignors to Opex Corporation, Cherry Hill, N.J.
Filed Oct. 20, 1981, Ser. No. 312,949
Term of patent 14 years
U.S. Cl. D6—422

277,625
COMBINED DESK AND RETURN
Bruce R. Hannah, Cold Spring, N.Y., assignor to Knoll International, Inc., New York, N.Y.
Division of Ser. No. 153,870, May 28, 1980, Pat. No. Des. 270,409. This application Feb. 22, 1983, Ser. No. 468,377
Term of patent 14 years
U.S. Cl. D6—422

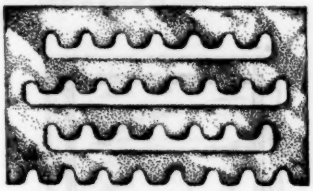


277,626
MOBILE CLOTHIING DISPLAY RACK
Jonathan M. Evans, San Francisco, Calif., assignor to Esprit de Corp, San Francisco, Calif.
Filed Jun. 1, 1982, Ser. No. 383,352
Term of patent 14 years
U.S. Cl. D6—317

277,627
INTERIOR SHELF FOR A SECURITY SAFE, GUN CABINET, VAULT OR THE LIKE
Stanford E. Shaw, Orem, Utah, assignor to Provo Steel and Supply Company, Salt Lake City, Utah
Filed Nov. 15, 1982, Ser. No. 441,505
Term of patent 14 years
U.S. Cl. D6—574

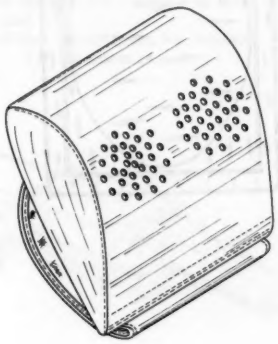


277,628
INTERIOR SHELF FOR A SECURITY SAFE, GUN CABINET, VAULT OR THE LIKE
Stanford E. Shaw, Orem, Utah, assignor to Provo Steel & Supply Company, Salt Lake City, Utah
Filed Nov. 15, 1982, Ser. No. 441,506
Term of patent 14 years
U.S. Cl. D6—514

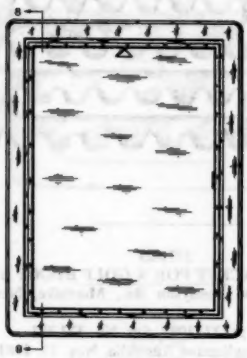


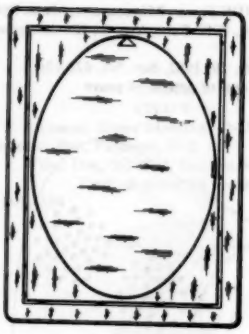
277,629
SUPPORT BRACKET FOR A GOLF BUGGY SEAT
Douglas Murray, 36 Tennyson Rd., Mortlake, New South Wales, Australia
Filed Apr. 27, 1982, Ser. No. 372,391
Claims priority, application Australia, Nov. 19, 1981, 85807
Term of patent 14 years
U.S. Cl. D6—500

277,630
STEREO HEADREST FOR DENTAL CHAIRS
David V. Olson, 324 IDS Tower, Minneapolis, Minn. 55402, and Steven T. Matthews, 8900 Penn Ave. S., Bloomington, Minn. 55431
Filed Sep. 29, 1982, Ser. No. 428,126
Term of patent 14 years
U.S. Cl. D6—501

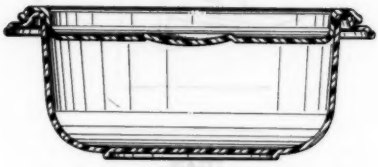


277,631
DOCUMENT HOLDER
Fred C. Biome, 6447 Hilltop La., Maumee, Ohio 43537
Filed Dec. 29, 1982, Ser. No. 454,462
Term of patent 14 years
U.S. Cl. D6—311

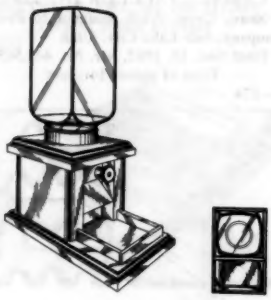




277,632
FOOD STORAGE DISH
Donald J. Staufenberg, Hudsonville, Mich., assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Feb. 19, 1982, Ser. No. 350,306
Term of patent 14 years
U.S. Cl. D7—76



277,633
DISPENSER FOR CANDY, NUTS OR THE LIKE
Thomas M. McClellan, 208 Alger Dr., Blue Springs, Mo. 64015, assignor to Thomas M. McClellan, Blue Springs, Mo.
Filed May 28, 1982, Ser. No. 383,015
Term of patent 14 years
U.S. Cl. D7—76



277,634

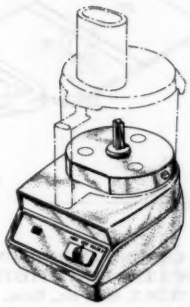
FOOD PROCESSOR POWER UNIT

Lawrence A. Doggett, Dayton, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Dec. 20, 1982, Ser. No. 451,128

Term of patent 14 years

U.S. Cl. D7—386



277,635

OPENER FOR PULL-TAB CANS AND BOTTLES

Glenn A. Sherwood, 1044 Menlo Oaks, Menlo Park, Calif. 94025

Filed Oct. 26, 1981, Ser. No. 315,356

Term of patent 14 years

U.S. Cl. D8—18

277,636

CONTROL HOUSING FOR A SOLDERING DEVICE

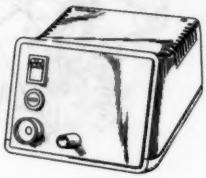
Günther Rittmann, Lochgau, Fed. Rep. of Germany, assignor to The Cooper Group Deutschland GmbH, Besigheim, Fed. Rep. of Germany

Division of Ser. No. 321,316, Nov. 13, 1981,. This application Dec. 9, 1983, Ser. No. 559,873

Claims priority, application Fed. Rep. of Germany, May 13, 1981, MR18189

Term of patent 14 years

U.S. Cl. D8—30



277,637

WOOD SPLITTER

Jeffrey H. TePastte, 2797 Croton Rd., Newago, Mich. 49337, and Kenneth L. Friedrich, 11337-52nd St., Lowell, Mich. 49331

Continuation-in-part of Ser. No. 212,692, Dec. 3, 1980,. This application Aug. 22, 1983, Ser. No. 525,016

Term of patent 14 years

U.S. Cl. D8—47

277,638

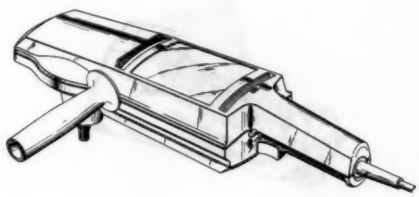
SANDER/POLISHER

Robert I. Somers, Raleigh, N.C., assignor to Black & Decker Inc., Newark, Del.

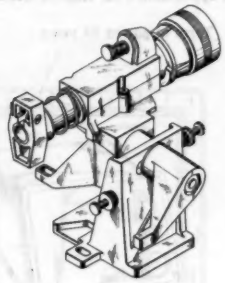
Filed Mar. 30, 1982, Ser. No. 363,643

Term of patent 14 years

U.S. Cl. D8—62

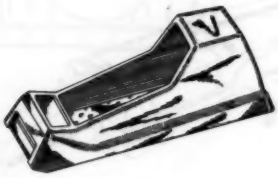


277,639
DRILL BIT HOLDER FOR SHARPENING OR SIMILAR ARTICLE
Edward V. Welliver, 3522 Rotary Rd., Rockford, Ill. 61109
Filed Mar. 30, 1982, Ser. No. 363,519
Term of patent 14 years
U.S. Cl. D8—72



277,640
PLASTIC TIRE LEVER
Joannes H. Drexler, Doesburg, Netherlands, assignor to B.V. Machine-en Metaalwarenfabriek "Dremefa", Doesburg, Netherlands
Filed Oct. 13, 1982, Ser. No. 434,090
Claims priority, application Benelux, Apr. 20, 1982, 56784-01/02
Term of patent 14 years
U.S. Cl. D8—88

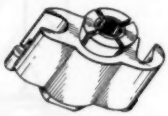
277,641
PLANING TOOL
Robert R. Hayes, Euclid, and George H. Frost, Kent, both of Ohio, assignors to Oatey Co., Cleveland, Ohio
Filed Aug. 14, 1981, Ser. No. 293,001
Term of patent 14 years
U.S. Cl. D8—101

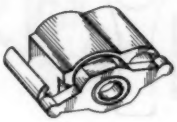


277,642
GROMMET TAB
Cornelius A. Hinsperger, 21 Richgrove Dr., #710, Weston, Ontario, Canada
Filed Sep. 20, 1982, Ser. No. 420,693
Claims priority, application Canada, Aug. 26, 1982, 26-08-82-1
Term of patent 14 years
U.S. Cl. D8—356

277,643
HOLDER AND GROUND ANCHOR UNIT FOR RECTANGULAR FENCE POSTS
David G. Fambrough, 13205 S. Hills Dr., Reno, Nev. 89511
Filed Aug. 5, 1982, Ser. No. 405,682
Term of patent 14 years
U.S. Cl. D8—373

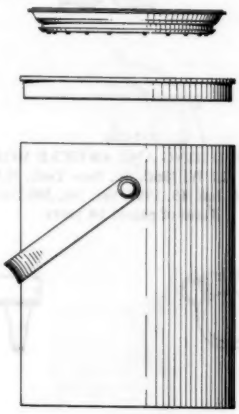
277,644
LOCKING DEVICE FOR AN END CLAMP FOR METAL WIRES
Esko M. Tölkkö, Porvoo, Finland, assignor to Oy Ensto AB, Porvoo, Finland
Filed Aug. 17, 1982, Ser. No. 408,744
Term of patent 14 years
U.S. Cl. D8—396





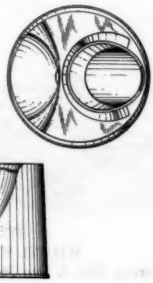
277,645
SECURITY STOP FOR DOORS
Brian F. McGarry, 578 Harewood Rd., Christchurch, New Zealand
Filed Oct. 26, 1982, Ser. No. 436,713
Claims priority, application New Zealand, May 14, 1982, 17693
Term of patent 14 years
U.S. Cl. D8—402

277,646
COMBINED COVERED PAIL AND DETACHABLE RIM
Helge D. Jorgensen, Copenhagen, Denmark, assignor to Superfos Emballage a/s, Vipperod, Denmark
Filed Dec. 15, 1981, Ser. No. 331,908
Claims priority, application Denmark, Aug. 12, 1981, 781/81
Term of patent 14 years
U.S. Cl. D9—352



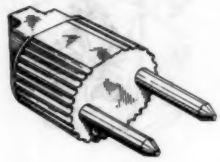
277,647
BOTTLE
James Lane, Ontario, Canada, assignor to The Drackett Company, Cincinnati, Ohio
Filed Mar. 18, 1982, Ser. No. 359,543
Claims priority, application Canada, Oct. 7, 1981, 70-10-81-5
Term of patent 14 years
U.S. Cl. D9—377

277,648
AEROSOL CAN OVERCAP
David A. Jones, Kettering, Ohio, assignor to The Drackett Company, Cincinnati, Ohio
Filed Sep. 9, 1982, Ser. No. 416,522
Term of patent 14 years
U.S. Cl. D9—445

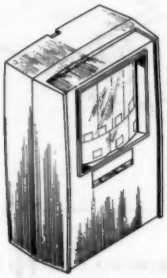


277,649
WRIST WATCH
Alain Glauser, Carouge, Switzerland, assignor to Baume & Mercier S.A., Geneva, Switzerland
Filed May 7, 1981, Ser. No. 261,615
Term of patent 14 years
U.S. Cl. D10—32

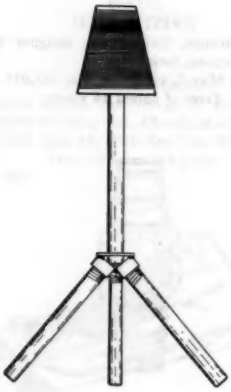
277,650
MAGNETIC TESTER
Dennis W. Mulvaney, 23862 Windmill La., Laguna Niguel, Calif. 92677
Filed Jul. 9, 1982, Ser. No. 396,795
Term of patent 14 years
U.S. Cl. D10—78



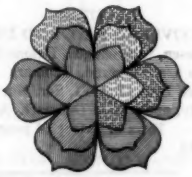
277,652
PASSIVE INFRARED INTRUSION DETECTOR UNIT
William G. Kahl, Jr., Brookfield, and Ronald G. Avery, Bethel, both of Conn., assignors to Cerberus AG, Mannedorf, Switzerland
Filed Aug. 16, 1982, Ser. No. 407,930
Term of patent 14 years
U.S. Cl. D10—106



277,651
WHEEL BALANCER
Tom A. Herron, Rte. 3, Box 362, Sapulpa, Okla. 74066
Filed Sep. 30, 1982, Ser. No. 430,130
Term of patent 14 years
U.S. Cl. D10—82



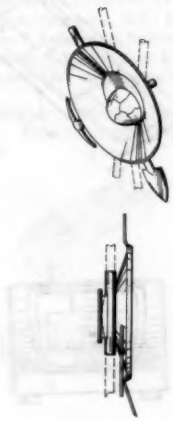
277,653
CLOCK FACE
Louis W. Jagoe, 210 Tanglewood Pl., #S-102, Tampa, Fla. 33617
Filed Sep. 28, 1982, Ser. No. 426,239
Term of patent 14 years
U.S. Cl. D10—123



277,654
COMBINED RING AND ARTICLE HOLDER
Genaro Texidor, 522 W. 136th St., New York, N.Y. 10031
Filed Jun. 15, 1982, Ser. No. 388,702
Term of patent 14 years
U.S. Cl. D11—2

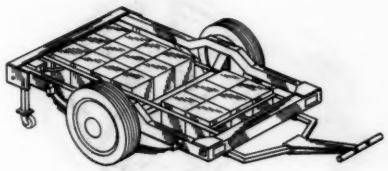
277,655
COMBINED RING AND ARTICLE HOLDER
Genaro Texidor, 522 W. 136th St., New York, N.Y. 10031
Filed Jun. 15, 1982, Ser. No. 388,701
Term of patent 14 years
U.S. Cl. D11—31

277,656
JEWELRY SLIDE
Katherine D. Johnston, 3242 E. Endora, Phoenix, Ariz. 85032; Clarence Johnston, deceased, late of Phoenix, Ariz., and by Katherine D. Johnston, heir, 3242 E. Endora, Phoenix, Ariz. 85032
Filed May 14, 1982, Ser. No. 378,120
Term of patent 14 years
U.S. Cl. D11—81



277,657
SURFACE EFFECT SHIP
John B. Chaplin, Covington, La., assignor to Textron Inc., Providence, R.I.
Filed Dec. 2, 1982, Ser. No. 446,388
Term of patent 14 years
U.S. Cl. D12—5

277,658
MOBILE BATTERY CARRIAGE
Edwin M. King, Royal Oak, Mich., assignor to Extran Corporation, Littleton, Conn.
Filed Aug. 20, 1981, Ser. No. 294,628
Term of patent 14 years
U.S. Cl. D12—101

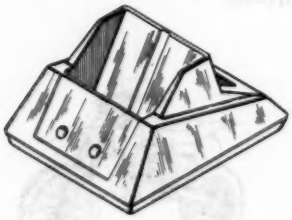


277,659
MOTORCYCLE
Norio Hoshi, Fujimi, and Shigeru Hattori, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 12, 1982, Ser. No. 397,465
Claims priority, application Japan, Jan. 12, 1982, 57/878
Term of patent 14 years
U.S. Cl. D12—110

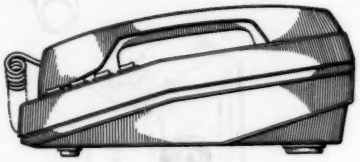
277,660
VEHICLE WHEEL
Giorgetto Giugiaro, Turin, Italy, assignor to Nihon Melber Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 13, 1982, Ser. No. 449,209
Term of patent 14 years
U.S. Cl. D12—204

277,661
VEHICLE WHEEL
John A. Cafaro, and Jerry P. Palmer, both of Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 1, 1980, Ser. No. 174,638
Term of patent 14 years
U.S. Cl. D12—211

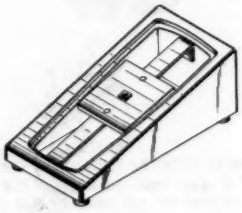
277,662
RADIO BATTERY CHARGER
Robert R. Huntington, and Henry A. Schaefer, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.
Filed Sep. 27, 1982, Ser. No. 424,758
Term of patent 14 years
U.S. Cl. D13—5

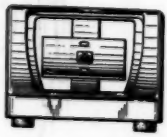


277,663
TELEPHONE
Motoaki Sakamoto, Tanashi, and Ichiro Sato, Maebashi, both of Japan, assignors to Nakayo Telecommunications Inc., Tokyo, Japan
Filed May 26, 1982, Ser. No. 382,465
Claims priority, application Japan, Dec. 12, 1981, 56/54815
Term of patent 14 years
U.S. Cl. D14—58



277,664
TELEPHONE SET STAND
William L. Wilt, Shreveport, La., assignor to AT&T Technologies, Inc., New York, N.Y.
Filed Dec. 16, 1982, Ser. No. 450,573
Term of patent 14 years
U.S. Cl. D14—60





277,665

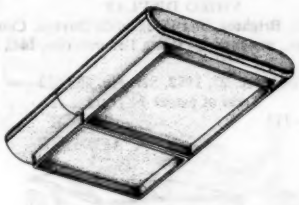
TELEPHONE BASE WITH EXTENDER

Donald M. Genaro, Haworth, N.J.; Jerome M. Gotway; Norris R. Hall, both of Indianapolis, Ind., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 455,888, Jan. 5, 1983,. This application May 21, 1984, Ser. No. 612,466

Term of patent 14 years

U.S. Cl. D14—60



277,666

HOUSING FOR A TELEPHONE STATION HANDSET

Ghanshyam A. Bhat, Marlboro, N.J.; Eric P. P. Chan, New York, N.Y.; John S. Lamancusa, Middletown, N.J.; Gordon E. Sylvester, Jamaica, N.Y., and Jose R. Varela, Middletown, N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Jun. 5, 1984, Ser. No. 617,516

Term of patent 14 years

U.S. Cl. D14—63

277,667

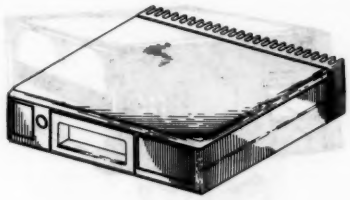
VEHICULAR RADIO HOUSING OR SIMILAR ARTICLE

Ronald A. Zurawski, Rolling Meadows, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 13, 1982, Ser. No. 417,017

Term of patent 14 years

U.S. Cl. D14—68



277,668

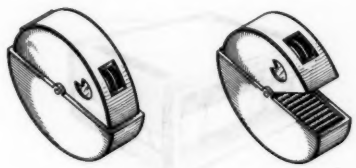
RADIO

Rouben T. Terzian, Chicago, and Horst D. Herbstler, Bolingbrook, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jul. 26, 1982, Ser. No. 401,535

Term of patent 14 years

U.S. Cl. D14—69



277,669

WALL PROJECTION CTV UNIT

David P. Chuboff, North Barrington, and Arnold S. Goldman, Clarendon Hills, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 25, 1982, Ser. No. 436,259

Term of patent 14 years

U.S. Cl. D14—84

277,670

ELECTRONIC INSTRUMENT FOR LOGGING DATA

Jeffrey C. Brown, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Apr. 29, 1982, Ser. No. 373,007

Term of patent 14 years

U.S. Cl. D14—100

277,671

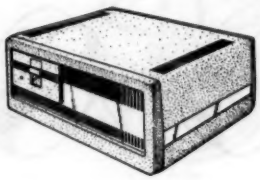
COMPUTER CONSOLE

Michael Cridland, Manlius, N.Y., and David P. Moriconi, Ben Lomond, Calif., assignors to Victor Technologies, Inc., Scotts Valley, Calif.

Filed Nov. 15, 1982, Ser. No. 441,877

Term of patent 14 years

U.S. Cl. D14—100



277,672

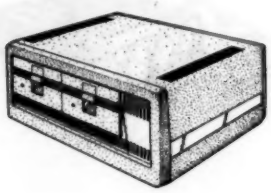
COMPUTER CONSOLE

Michael Cridland, Manlius, N.Y., and David P. Moriconi, Ben Lomond, Calif., assignors to Victor Technologies, Inc., Scotts Valley, Calif.

Filed Nov. 15, 1982, Ser. No. 441,885

Term of patent 14 years

U.S. Cl. D14—100



277,673

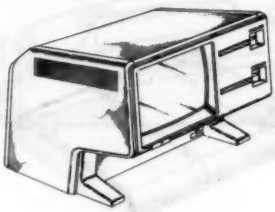
COMPUTER

William F. Dresselhaus, Redwood City; Kenneth S. Campbell, Mountain View; Clive R. Twyman, Fremont, all of Calif., and Douglas C. Dayton, Cambridge, Mass., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jun. 10, 1982, Ser. No. 387,029

Term of patent 14 years

U.S. Cl. D14—106



277,674

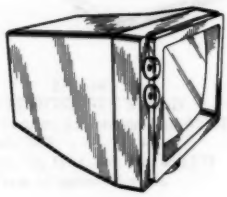
VIDEO DISPLAY

Karen L. Usab, Brighton, and Douglas C. Dayton, Cambridge, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Dec. 27, 1982, Ser. No. 453,072

Term of patent 14 years

U.S. Cl. D14—113



277,675

MINI AIR COMPRESSOR AND THE LIKE

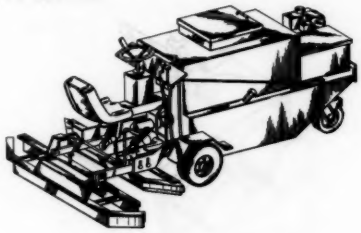
Michael Hung, 6th Floor, No. 683 Ming Shen E. Rd., Taipei, Taiwan

Filed Jan. 26, 1982, Ser. No. 342,778

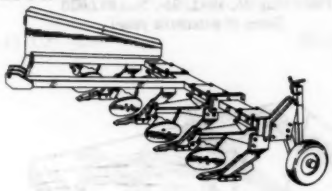
Term of patent 14 years

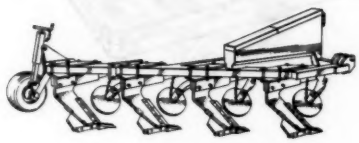
U.S. Cl. D15—7

277,676
PAVEMENT SEALING MACHINE
Harold W. Neal, 112 Dunwoody Dr., Carrollton, Ga. 30117
Filed Jul. 30, 1982, Ser. No. 403,561
Term of patent 14 years
U.S. Cl. D15—13



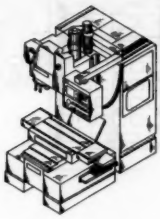
277,677
CULTIVATING IMPLEMENT
Barry A. Linger, Harleston, England, assignor to Howard Machinery Limited, Harleston, England
Filed Nov. 27, 1981, Ser. No. 325,278
Claims priority, application United Kingdom, May 26, 1981, 1000662
Term of patent 14 years
U.S. Cl. D15—27



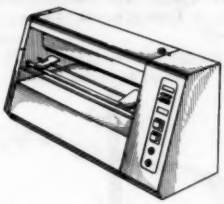


277,678
AUTOGENOUS IMPACT MILL
Alvin A. Snaper, 2800 Cameo Cir., Las Vegas, Nev. 89107
Filed Sep. 8, 1982, Ser. No. 415,891
Term of patent 14 years
U.S. Cl. D15—123

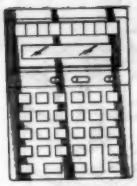
277,679
MACHINING CENTER
Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Takaoka, Japan
Filed Feb. 8, 1982, Ser. No. 346,931
Term of patent 14 years
U.S. Cl. D15—127

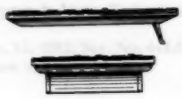


277,680
CONTINUOUS FORM CHECK SIGNER
Kenneth M. Hattori, Jr., Bensenville, Ill., assignor to The Hedman Company, Chicago, Ill.
Filed Oct. 22, 1982, Ser. No. 436,987
Term of patent 14 years
U.S. Cl. D18—5



277,681
CALCULATOR
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 24, 1982, Ser. No. 361,486
Term of patent 14 years
U.S. Cl. D18—7

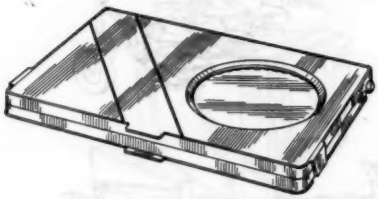




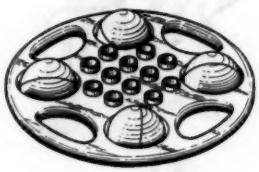
277,682
WRITING INSTRUMENT
S. Richard Luntz, 22150 S. Woodland Rd., Shaker Heights, Ohio 44122
Filed Sep. 7, 1982, Ser. No. 415,752
Term of patent 14 years
U.S. Cl. D19—47

277,683
SIGN POST ASSEMBLY
Joseph B. Glassford, 620 N. Arbogast, Griffith, Ind. 46319
Filed Sep. 27, 1982, Ser. No. 423,556
Term of patent 14 years
U.S. Cl. D20—17

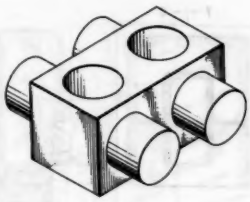
277,684
TOY FOR DRAWING DESIGNS
Douglas R. Miller, and George D. Smith, both of Cincinnati, Ohio, assignors to CPG Products Corp., Minneapolis, Minn.
Filed May 26, 1982, Ser. No. 382,020
Term of patent 14 years
U.S. Cl. D21—59



277,685
ACTIVITY TOY
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Jun. 11, 1982, Ser. No. 387,286
Term of patent 14 years
U.S. Cl. D21—59

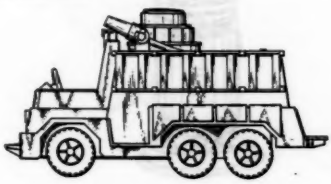


277,686
TOY BLOCK
Yasushi Chatani, Tokorozawa, and Toshio Tsuchikura, Koshigaya, both of Japan, assignors to Kawada Co., Ltd., Tokyo, Japan
Filed Aug. 7, 1979, Ser. No. 64,488
Term of patent 14 years
U.S. Cl. D21—108

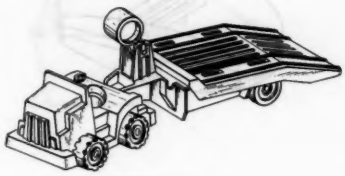


277,687
TOY TRUCK
Gordon Cutler, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 27, 1983, Ser. No. 461,582
Term of patent 14 years
U.S. Cl. D21—128

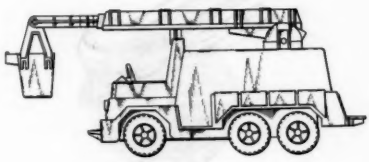
277,688
TOY FIRE TRUCK
Kenneth R. Wilkes, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 21, 1983, Ser. No. 459,774
Term of patent 14 years
U.S. Cl. D21—133



277,689
TOY VEHICLE
Mary A. Smith, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 20, 1983, Ser. No. 459,489
Term of patent 14 years
U.S. Cl. D21—134

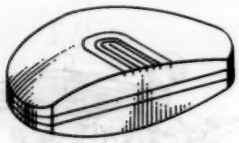


277,690
TOY UTILITY TRUCK
Kenneth R. Wilkes, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 21, 1983, Ser. No. 459,809
Term of patent 14 years
U.S. Cl. D21—135



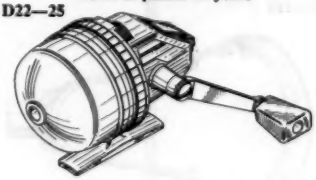
277,691
LACROSSE STICK HEAD
Robert J. Rule, Manhasset, N.Y., assignor to W. H. Brine Company, Milford, Mass.
Filed Feb. 3, 1982, Ser. No. 345,229
Term of patent 14 years
U.S. Cl. D21—210

277,692
PUTTER HEAD
Alexander S. O. MacDougall, 495 Valley Club Rd., Santa Barbara, Calif. 93108
Filed Feb. 8, 1982, Ser. No. 347,055
Term of patent 14 years
U.S. Cl. D21—219

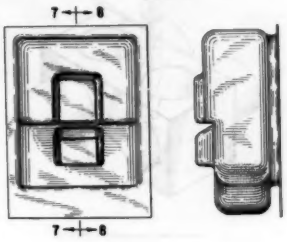


277,693
GOALER SKATE
Rene Bourque, Duvernay, Canada, assignor to Warrington Inc., Montreal, Canada
Filed Mar. 8, 1982, Ser. No. 355,387
Claims priority, application Canada, Jan. 29, 1982, 29-01-82-7
Term of patent 14 years
U.S. Cl. D21—225

277,694
FISHING REEL
Masakazu Sakamoto, and Takeshi Shohoji, both of Funabashi, Japan, assignors to Ryobi Limited, Fuchu, Japan
Division of Ser. No. 340,055, Jan. 18, 1982,. This application Jan. 18, 1984, Ser. No. 571,706
Claims priority, application Japan, Jul. 31, 1981, 56-34181; Jul. 31, 1981, 56-34182; Sep. 1, 1981, 56-38807
Term of patent 14 years
U.S. Cl. D22—25



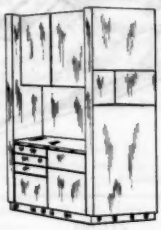
277,695
COMBINED TUB AND SHOWER STALL
Leif Blodee, Holland, Mich., assignor to Riblet Products Corporation, Elkhart, Ind.
Filed Apr. 19, 1982, Ser. No. 369,939
Term of patent 14 years
U.S. Cl. D23—49



277,696
COMBINED OVERFLOW HOOD AND DRAIN CONTROL
Donald W. Doman, Janesville, and Philip F. Segor, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Sep. 28, 1982, Ser. No. 426,209
Term of patent 14 years
U.S. Cl. D23—69

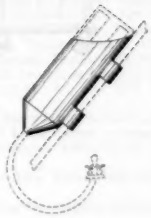
277,697
OILSTOVE
Nobuyuki Kojima; Youichi Sekigawa, both of Kamo, and Kazunori Amano, Niitsu, all of Japan, assignors to Toshiba Heating Appliances Co., Ltd., Kamo, Japan
Filed Dec. 22, 1982, Ser. No. 452,211
Term of patent 14 years
U.S. Cl. D23—121

277,698
DENTIST SERVICE UNIT
David E. J. Newman, Toronto, Canada, assignor to D.I. Retail Planning & Design Ltd., Toronto, Canada
Filed Aug. 12, 1982, Ser. No. 407,597
Claims priority, application Canada, Apr. 27, 1982, 27-04-82-14
Term of patent 14 years
U.S. Cl. D24—4

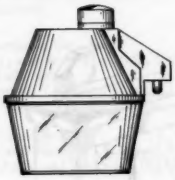


277,699
MICROSCOPE LABORATORY SLIDE
Donald W. Valencia, El Dorado Hills, Calif., assignor to Immuno Concepts, Inc., Sacramento, Calif.
Filed Jan. 9, 1981, Ser. No. 223,908
Term of patent 14 years
U.S. Cl. D24—29

277,700
BABY BOTTLE HOLDER
Larry P. Heber, and Blayde M. Penza, both of Vacaville, Calif., assignors to IDS Products, Inc., Vacaville, Calif.
Filed Jun. 28, 1982, Ser. No. 392,855
Term of patent 14 years
U.S. Cl. D24—48

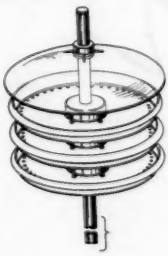


277,701
OUTDOOR LUMINAIRE
Giovanni deCandia, Germantown, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Aug. 4, 1982, Ser. No. 405,178
Term of patent 14 years
U.S. Cl. D26—67

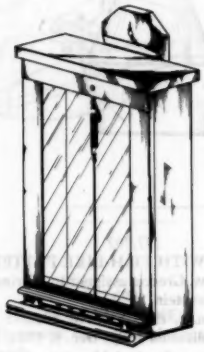


277,702
ASHTRAY WITH FISH-LIKE PATTERN
Marina Bulgari, Athens, Greece, assignor to Marina B. Creation S.A., Vaduz, Liechtenstein
Filed Jun. 6, 1983, Ser. No. 501,375
Claims priority, application Italy, Dec. 6, 1982, 36197 B/82
Term of patent 14 years
U.S. Cl. D27—23

277,703
TIERED BIRD FEEDER
Peter Kilham, Mill Rd., Foster, R.I. 02825
Filed Feb. 7, 1983, Ser. No. 464,192
Term of patent 14 years
U.S. Cl. D30—14



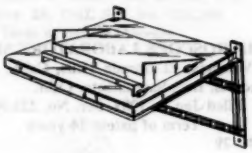
277,704
BIRD FEEDER
Allan W. Dehls, 1010 Whittemore Pt. Rd., Bridgewater, N.H. 03222
Filed Oct. 27, 1983, Ser. No. 546,032
Term of patent 14 years
U.S. Cl. D30—15



277,705
PET FOOD DISH HOLDER
Paul A. Bello, 1109 Ralph Ter. 2, Saint Louis, Mo. 63117
Filed Jun. 18, 1982, Ser. No. 295,254
Term of patent 14 years
U.S. Cl. D30—16

277,706
VACUUM CLEANER OR THE LIKE
Richard A. Wareham, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Mar. 29, 1982, Ser. No. 362,884
Term of patent 14 years
U.S. Cl. D32—18

277,707
HOLDER FOR A PLASTIC TRASH BAG DESIGN
Ezequiel Rico, 18092 Pamela, Villa Park, Calif. 92667
Filed Mar. 8, 1982, Ser. No. 355,901
Term of patent 14 years
U.S. Cl. D34—6



277,708
CART FOR HANDLING BIOLOGICAL TISSUE
James H. Becker, Topeka, Kans., assignor to Marketing International, Inc., Topeka, Kans.
Filed Oct. 19, 1982, Ser. No. 435,244
Term of patent 14 years
U.S. Cl. D34—20

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF FEBRUARY, 1985

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A&A Manufacturing Co., Inc.: *See*—
Klein, Ernst, 4,499,720, Cl. 59-78.100.

A. Ahlstrom Osakeyhtio: *See*—
Heikkila, Sakari, 4,500,835, Cl. 324-58.50R.

A. B. Chance Company: *See*—
Hoyt, Robert M.; Bobbitt, Donald E.; Bartee, Gary E.; Garton, Stanley C.; and Pilliard, J. Paul, 4,499,698, Cl. 52-157.000.

A. H. Robins Company, Incorporated: *See*—
Shanklin, James R., Jr.; and Johnson, Christopher P., III, 4,500,529, Cl. 514-235.000.

A. Mion S.p.A. Nastrificio: *See*—
Mion, Sergio, 4,500,372, Cl. 156-73.300.

A. O. Smith Harvestore Products, Inc.: *See*—
Nelson, Delmer R., 4,499,820, Cl. 99-646.00S.

A.P.V. Company Limited, The: *See*—
Allison, John, 4,499,942, Cl. 165-78.000.

A/S Bjolvefossen: *See*—
Else, George E.; Millward, Cyril; Dixon, Ronald H. T.; and Jorgensen, Knut, 4,500,352, Cl. 75-130.00B.

Ab Asea-Atom: *See*—
Ode, Bengt; and Tornblom, Lars, 4,500,261, Cl. 417-203.000.

AB Volvo: *See*—
Friberg, Gunnar S., 4,499,926, Cl. 138-126.000.

Abbott Laboratories: *See*—
Carlsen, Russell O.; Casati, Francois M.; and Raden, Daniel S., 4,500,654, Cl. 521-129.000.
Debernardis, John F.; and Arendsen, David L., 4,500,543, Cl. 514-469.000.

Abe, Michio; and Maeda, Naoyuki, to Tokai TRW & Co. Ltd. Power steering system. 4,499,964, Cl. 180-142.000.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,500,983, Cl. 369-77.200.

Abele, Manlio, to New York University. Apparatus for stereotactic surgery. 4,501,009, Cl. 378-19.000.

Abeysekera, Ratnayake M. S. S.: *See*—
Persoon, Eric H. J.; and Abeysekera, Ratnayake M. S. S., 4,501,016, Cl. 382-22.000.

Aburaki, Shimpei: *See*—
Imae, Kiyoto; Aburaki, Shimpei; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, 4,500,526, Cl. 514-226.000.

Ackerman, Daniel W., to Universal Instruments Corporation. Method and apparatus for proper registration of mating parts. 4,500,032, Cl. 228-180.00A.

Ackerman, John P.: *See*—
Zwick, Stanley A.; and Ackerman, John P., 4,499,663, Cl. 29-623.100.

Ackley, E. Michael. Capsule handling apparatus. 4,500,012, Cl. 221-173.000.

Adam, Klaus: *See*—
Gerber, Heinz; Adam, Klaus; and Horn, Heinz, 4,499,750, Cl. 72-351.000.

Adcock, Gerald. Method for removing earth cuttings from holes being formed by a pneumatically exhausted drill tool. 4,499,957, Cl. 175-71.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Minagawa, Motonobu; Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,500,663, Cl. 524-101.000.

Adell, Robert, to U.S. Product Development Company. Door edge guard. 4,499,689, Cl. 49-462.000.

Aeppli, Kurt, to Zellweger Uster Ltd. Apparatus for controlling the titer of synthetic fiber tows. 4,500,792, Cl. 250-560.000.

Agency of Industrial Science & Technology: *See*—
Enomoto, Yuji, 4,500,564, Cl. 427-39.000.
Ogura, Mutsuo, 4,500,204, Cl. 356-318.000.
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Inai, Yuichi; Kohara, Yoshiyuki; Kawakami, Yoshiyuki; and Tsurugi, Tomio, 4,500,463, Cl. 260-406.000.

Agrigenetics Research Associates Limited: *See*—
Lawrence, Robert H., Jr.; and Hill, Phillip E., 4,499,687, Cl. 47-58.000.

Ahner, Peter; Harer, Helmut; and Schustek, Siegfried, to Robert Bosch GmbH. Combined liquid-cooled on-board network generator and heater for mobile vehicles. 4,500,772, Cl. 219-209.000.

Aibe, Toshio: *See*—
Nishino, Hiroshi; Aibe, Toshio; and Noguchi, Katsuya, 4,500,327, Cl. 55-72.000.

Aigo, Seiichiro. Carrier for cleaning and etching wafers. 4,500,080, Cl. 269-56.000.

Air Preheater Company, Inc., The: *See*—
Sunter, Thomas C., 4,500,326, Cl. 55-21.000.

Air Products and Chemicals, Inc.: *See*—
Older, Geoffrey I.; and Webb, Leigh S., 4,499,740, Cl. 62-374.000.

Aisan Industry Co., Ltd.: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,500,476, Cl. 261-44.00C.

Aisin Seiki Kabushiki Kaisha: *See*—
Nakane, Takeshi; and Nakagawa, Katsumi, 4,500,864, Cl. 338-4.000.
Yamamoto, Kimihiko; and Ishikawa, Hitoshi, 4,499,837, Cl. 112-158.00A.

Akae, Yoshifumi: *See*—
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; and Tanaka, Toshinori, 4,500,794, Cl. 290-38.00C.

Akagawa, Masaki: *See*—
Sugimoto, Osamu; and Akagawa, Masaki, 4,499,982, Cl. 194-1.00N.

Akano, Shinichi; Goto, Tsutomu; Watanabe, Hiroshi; Kuroda, Masato; Ishikawa, Sakae; and Matsumoto, Ryoichiro, to Yamatake-Honeywell Co., Ltd. Electromagnetic flowmeter. 4,499,754, Cl. 73-861.120.

Akashi, Fumio, to NEC Corporation. Data communication device including circuitry responsive to an overflow of an input packet buffer for causing a collision. 4,500,990, Cl. 370-85.000.

Akazawa, Hiroyuki, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Paper feeding apparatus for printers. 4,500,023, Cl. 226-76.000.

Akifiev, Oleg N.: *See*—
Grinberg, Grigory M.; Akifiev, Oleg N.; Pytel, Jury A.; Gilev, Anatoly P.; and Paberza, Monika Y., 4,500,516, Cl. 424-156.000.

Akihiro, Hirai: *See*—
Reiji, Oguma; and Akihiro, Hirai, 4,500,642, Cl. 501-54.000.

Akiyama, Takeshi, to Mabuchi Motor Co., Ltd. Small electric motor. 4,500,804, Cl. 310-40.0MM.

Akram, M. Faheem, to Motorola, Inc. Current source. 4,500,831, Cl. 323-315.000.

Alcan International Limited: *See*—
Gesing, Adam J.; and Stratford, Graham, 4,500,643, Cl. 501-96.000.

Alfa-Laval AB: *See*—
Wikholm, Bert S., 4,500,322, Cl. 48-191.000.

Allemann, Martin; and Kellerhals, Hanspeter, to Spectrospin AG. Method of calibrating ion cyclotron resonance spectrometers. 4,500,782, Cl. 250-291.000.

Allen, Dillis V. Automated conveyor system. 4,499,991, Cl. 198-472.000.

Allied Corporation: *See*—
Briones, Francisco R.; and Boutros, Kamal S., 4,500,159, Cl. 339-147.00R.
Collins, Gordon T., 4,500,154, Cl. 339-89.00M.
Hanson, John D.; and Cook, John E., 4,499,916, Cl. 137-103.000.
Schmidt, John C.; Sands, Clifton A.; and Campbell, Donald N., 4,500,391, Cl. 204-1.00T.
Thorton, Donald I.; and Peyton, Richard H., 4,500,425, Cl. 210-136.000.

Allison, John, to A.P.V. Company Limited, The. Plate heat exchanger. 4,499,942, Cl. 165-78.000.

Allor, Richard L.; and Caverly, John C., to Ford Motor Company. Method of attaching a metal shaft to a ceramic shaft and product produced thereby. 4,499,646, Cl. 29-447.000.

Alpha Industries, Inc.: *See*—
Borzym, John J.; and Borzym, Alexander, 4,499,803, Cl. 83-319.000.

Alps Electric Co., Ltd.: *See*—
Izumi, Hiroshi, 4,500,941, Cl. 361-293.000.
Ohyama, Tohru; and Nigorikawa, Shigeru, 4,500,920, Cl. 358-139.000.

Alsthom-Atlantique: *See*—
Bessay, Raymond; and Riollet, Gilbert, 4,500,256, Cl. 415-191.000.
Riollet, Gilbert; and Bessay, Raymond, 4,500,070, Cl. 251-282.000.
Romand-Monnier, Jacques; and Lejeune, Jean-Pierre, 4,500,226, Cl. 403-13.000.

Aluminum Company of America: *See*—
Weyand, John D.; Woods, Robert W.; DeYoung, David H.; and Ray, Siba P., 4,500,406, Cl. 204-293.000.

Amax Inc.: *See*—
Bond, Armand P.; Poznansky, Abraham; and Grobner, Paul J., 4,500,351, Cl. 75-128.00N.

American Filtrona Corporation: *See*—
Berger, Richard M., 4,499,912, Cl. 131-336.000.

American Hoechst Corporation: *See*—
Kelly, Michael G., 4,500,438, Cl. 252-8.750.

American Home Products Corporation: *See*—
Schouten, Henry G., 4,500,738, Cl. 568-433.000.

American Hospital Supply Corporation: *See*—
Redmond, Russell J.; and Ash, Jessica B., 4,500,311, Cl. 604-246.000.

AMF Incorporated: *See*—
Cummins, Donald L., 4,500,266, Cl. 417-474.000.

AMP Incorporated: *See*—
Brown, Christopher K.; Kensinger, Lex D.; Over, William R.; and Wion, Donald A., 4,499,648, Cl. 29-564.200.
Dola, Frank P., 4,500,158, Cl. 339-122.00R.
Huffnagle, Clifton W.; and Morningstar, LeRoy J., 4,500,157, Cl. 339-97.00R.

Ampex Corporation: *See*—
Chan, Steven S., 4,500,933, Cl. 360-69.000.
Kudelski, Stefan, 4,500,817, Cl. 318-7.000.

Amundsen, Alan R.; and Stern, Eric W., to Engelhard Corporation. Solubilized platinum (II) complexes. 4,500,465, Cl. 260-429.00R.

An-Rix, Inc.: *See*—
Goldstein, Leon C., 4,500,375, Cl. 156-96.000.

Anastasio, Frank J.; and Byro, Thomas, to Bobst SA. Flexible coupling for a gravure cylinder. 4,499,831, Cl. 101-152.000.

Anderson, Carl E. Scaffolding staging. 4,499,967, Cl. 182-222.000.

Anderson, Dennis M. Automatic pouring and dispensing machine for manufacturing hard and soft candy. 4,500,273, Cl. 425-143.000.

Anderson, Jerry C. Articulator device and method. 4,500,290, Cl. 433-54.000.

Anderson, William C.; Boundy, Bruce K.; and Schoumaker, Raoul J. P., to Westinghouse Electric Corp. Swivel-tilt platform. 4,500,060, Cl. 248-349.000.

Ando, Kunio: *See*—
Hosokawa, Tomoyoshi; Matsuura, Ikutoshi; Takahashi, Hidenori; Ando, Kunio; and Tamura, Gakuzo, 4,500,544, Cl. 514-543.000.

Antal, Paul S.; and Katz, Manfred, to Du Pont de Nemours, E. I., and Company. Reinforcement structure. 4,499,716, Cl. 57-234.000.

Anthony, Thomas R., to General Electric Company. Method for making alignment-enhancing feed-through conductors for stackable silicon-on-sapphire. 4,499,655, Cl. 29-576.00J.

Aoki, Eiichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments having automatic ensemble function. 4,499,808, Cl. 84-1.030.

Aoki, Kozo; Ogawa, Akira; and Tanabe, Osami, to Fuji Photo Film Co., Ltd. Color photographic silver halide light-sensitive material. 4,500,635, Cl. 430-552.000.

Aoki, Masahiro, to Olympus Optical Co., Ltd. Apparatus for detecting the focus condition of an imaging lens. 4,500,189, Cl. 354-407.000.

Aoki, Masanori, to Honda Giken Kogyo Kabushiki Kaisha. Rear fender structure for motorcycles. 4,500,101, Cl. 280-152.100.

Aono, Toshiaki; Hara, Hiroshi; and Naito, Hideki, to Fuji Photo Film Co., Ltd. Heat-developable diffusion transfer color photographic material with microcapsules. 4,500,624, Cl. 430-138.000.

Aono, Toshiaki: *See*—
Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; Sato, Kozo; and Fujita, Shinsaku, 4,500,626, Cl. 430-203.000.

Aoyama, Shunichi, to Nissan Motor Company, Limited. Multi-cylinder internal combustion engine. 4,499,870, Cl. 123-198.00F.

Apontoweil, Peter; and Krasselt, Manfred M., to Gist-Brocades N.V. Infectious bronchitis virus strain. 4,500,638, Cl. 435-235.000.

APX Group, Inc.: *See*—
Gerber, James E.; Kovacs, Robert J.; and Herrmann, Willy, 4,500,030, Cl. 228-125.000.

Aquarium Pharmaceuticals, Inc.: *See*—
Goldstein, Joel, 4,500,510, Cl. 424-80.000.

Aquarius fur Dichte Bauten AG: *See*—
Kaufmann, Peter, 4,499,925, Cl. 138-125.000.

Arai, Tetsuzo: *See*—
Satake, Jiro; Arai, Tetsuzo; Tanaka, Kivokazu; Mikami, Eiji; Moriyasu, Tsuneo; and Nakagawa, Tadasu, 4,500,577, Cl. 428-36.000.

Araki, Masafumi: *See*—
Ikenoya, Yasuo; Ueda, Shuso; and Araki, Masafumi, 4,499,724, Cl. 60-290.000.

Arata, Ryozo: *See*—
Minagawa, Motonobu; Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,500,663, Cl. 524-101.000.

Arcari, Giuliana: *See*—
Bernardi, Luigi; Temperilli, Aldemio; Ruggieri, Daniela; Arcari, Giuliana; and Salvati, Patricia, 4,500,712, Cl. 546-67.000.

Arendsen, David L.: *See*—
Debernardis, John F.; and Arendsen, David L., 4,500,543, Cl. 514-469.000.

Argus Chemical Corporation: *See*—
Brecker, Lawrence R.; and Keeley, Charles, 4,500,665, Cl. 524-227.000.

Arkles, Barry C., to Petrarch Systems Inc. Curable silicone containing compositions and methods of making same. 4,500,688, Cl. 525-431.000.

Arthur Shaw Manufacturing Limited: *See*—
Douglas, Jack E., 4,500,122, Cl. 292-161.000.

Asada, Masao: *See*—
Taya, Akira; Narita, Kazuo; Asada, Masao; and Kimura, Yoshio, 4,500,443, Cl. 252-301.40P.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kuroki, Yoshifumi, 4,500,190, Cl. 354-416.000.
Morizumi, Masaaki; Kando, Toru; and Haraguchi, Keisuke, 4,500,184, Cl. 354-149.110.

Asano, Hisoshi; Shimamune, Takayuki; Goto, Toshiki; and Hosonuma, Masashi, to Permelec Electrode Ltd. Cathode for electrolyzing acid solutions and process for producing the same. 4,500,405, Cl. 204-290.00F.

Ash, Jessica B.: *See*—
Redmond, Russell J.; and Ash, Jessica B., 4,500,311, Cl. 604-246.000.

Ashburn, John J.: *See*—
Karazim, Michael P.; Okashima, Bob Y.; and Ashburn, John J., 4,499,691, Cl. 51-241.00S.

Ashland Oil, Inc.: *See*—
Rabito, Thomas G.; Oswalt, Stephen M.; and Cline, Richard L., 4,500,606, Cl. 428-480.000.

Ashlock, L. T.; Mukamal, Harold; and White, William H., to Swedlow, Inc. Transparent, abrasion resistant coating compositions. 4,500,669, Cl. 524-440.000.

Askew, Dennis D.: *See*—
Odenthal, Conrad J.; and Askew, Dennis D., 4,500,809, Cl. 313-444.000.

Astier, Jean-Francois; Bessaguet, Louis; and Laplanche, Michel, to Legrand. Floating core transmission member for ultrasonic assistance. 4,500,272, Cl. 425-78.000.

Astier, Jean-Francois; Bessaguet, Louis; and LaPlanche, Michel, to Legrand. Vibration-aided feed device for a molding apparatus. 4,500,280, Cl. 425-569.000.

AT&T Bell Laboratories: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
Chang, Shih-Jeh, 4,500,985, Cl. 370-14.000.
Keramidas, Vassilis G.; and Lourenco, Jose A., 4,500,367, Cl. 148-171.000.
Lisco, Richard J., 4,500,844, Cl. 330-10.000.
Miller, Hubert A., 4,501,003, Cl. 375-94.000.
Ren, Chung-Li; Thompson, Matthew V.; and Wang, Han-Chiu, 4,500,859, Cl. 333-208.000.
Taylor, Gary N., 4,500,628, Cl. 430-311.000.
White, Jonathan C., 4,500,995, Cl. 372-3.000.

AT&T Technologies, Inc.: *See*—
Mackay, Robert D., 4,500,149, Cl. 339-17.00C.
Marx, Morris F., III, 4,500,481, Cl. 264-40.600.
Rizzo, John S., 4,500,394, Cl. 204-15.000.

Atlantic Richfield Company: *See*—
Lewis, Kathrine J., 4,499,658, Cl. 29-588.000.
Perkins, Thomas K., 4,499,948, Cl. 166-248.000.
Wright, Harold A., 4,500,692, Cl. 526-201.000.

Atlas Copco Aktiebolag: *See*—
Molin, Alexis, 4,499,953, Cl. 173-43.000.

Atlas Electronics International, Inc.: *See*—
Miller, Albert J., 4,501,005, Cl. 377-20.000.

Atsumi, Akira: *See*—
Kuroda, Shigeaki; Senshu, Takao; Oguni, Kensaku; Mochizuki, Taketoshi; Yasuda, Hiromu; Ishibane, Kyuhei; Atsumi, Akira; Kimura, Hideyuki; and Hatada, Toshio, 4,500,035, Cl. 236-92.00B.

Auchterlonie, Richard C. Offset QPSK demodulator and receiver. 4,501,002, Cl. 375-86.000.

Audeh, Costandi A., to Mobil Oil Corporation. Combined surface and in situ tar sand bitumen production. 4,499,949, Cl. 166-260.000.

Audeh, Costandi A., to Mobil Oil Corporation. Enhanced recovery of hydrocarbonaceous fluids from the oil shale. 4,500,414, Cl. 208-11.00R.

Austenal International, Inc.: *See*—
Fox, Adrian S., 4,500,658, Cl. 523-117.000.

Austin, James W.; Bradburn, Ronald G.; Cromwell, Clarence A.; Gratch, Eitan; Groiss, Erich; Perkins, Derek; and Walker, Robert A., to Brenda Mines Ltd. Process for purifying molybdenite concentrates. 4,500,496, Cl. 423-55.000.

Automobiles Citroen: *See*—
Harmand, Michel, 4,500,130, Cl. 296-65.00R.

Automobiles Peugeot: *See*—
Harmand, Michel, 4,500,130, Cl. 296-65.00R.

Avco Corporation: *See*—
De Ferrari, Alfred; and Doddman, William H., 4,500,038, Cl. 239-85.000.

Awater, Albert: *See*—
Goyert, Wilhelm; Grimm, Wolfgang; Awater, Albert; Wagner, Hans; and Kruger, Bruno, 4,500,671, Cl. 524-494.000.

Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, to Nihon Tokushu Noyaku Seizo K.K. Herbicidally active substituted phenylsulfonylurea derivatives and intermediates therefor. 4,500,342, Cl. 71-93.000.

Ayata, Naoki: *See*—
Koumura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, 4,500,918, Cl. 358-75.000.

Ayers, Ray R.; and Kipp, Robert M., to Shell Oil Company. Pipeline connector. 4,500,117, Cl. 285-3.000.

Ayers, Ray R., to Shell Oil Company. Marine electrical plug. 4,500,151, Cl. 339-59.00R.

B. F. Goodrich Company, The: *See*—
Lai, John T., 4,500,662, Cl. 524-99.000.
Parish, James M., 4,499,844, Cl. 114-367.000.
Tucker, Harold A., 4,500,684, Cl. 525-327.300.

B & H Manufacturing Company, Inc.: *See*—
Hoffman, Wolfgang, 4,500,386, Cl. 156-449.000.

B.W.B. Controls, Inc.: *See*—
Bergeron, Ned; and Stollberg, Theodore A., 4,499,846, Cl. 116-272.000.

Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., to AT&T Bell Laboratories. Geographically distributed multiprocessor time-shared communication processing system. 4,500,960, Cl. 364-200.000.

Bach, Nicholas J.; Kornfeld, Edmund C.; and Titus, Robert D., to Eli Lilly and Company. Hydroxyaminotetralincarboxamides. 4,500,545, Cl. 514-619.000.

Backe, Egbert; Muller, Rolf; Otto, Dieter; Leonardi, Cornelio; Kochendorfer, Heinrich; Fussner, Paul; Walker, Ewald; and Rommel, Rudi. Device and method for locking a drive shaft disposed in a fuel injection pump for internal combustion engines and holding bolt therefor. 4,499,757, Cl. 73-119.00A.

Backhaus, Martin: *See*—
Lubcke, Hartmut; and Backhaus, Martin, 4,500,991, Cl. 370-88.000.

Bacon, Forrest C.; and Nord, Keith W., to Ex-Cell-O Corporation. Corrugated box forming, loading and sealing machine. 4,499,704, Cl. 53-156.000.

Badger Meter, Inc.: *See*—
Fiorina, Mark A.; and Roberts, Todd N., 4,499,764, Cl. 73-253.000.

Baeger, Holm: *See*—
Nickol, Friedrich W.; and Baeger, Holm, 4,500,611, Cl. 428-686.000.

Bagwell, Bobby F.; and Wells, Rickey D. Dual hydraulic lifts. 4,500,071, Cl. 254-423.000.

Bailey, Julian C. Steamer. 4,499,819, Cl. 99-483.000.

Baji, Toru: *See*—
Koike, Norio; Tsukada, Toshihisa; Baji, Toru; and Sasano, Akira, 4,500,915, Cl. 358-44.000.

Baker, James W., Jr.: *See*—
Darland, Michael L.; Stoner, Donald L.; Baker, James W., Jr.; and Sponhnholtz, Michael A., 4,500,751, Cl. 179-2.0DP.

Bako, Lazlo; and Scelba, Stephen S., to Presto Lock, Inc. Security device for firearms. 4,499,681, Cl. 42-1.00Y.

Balazs, Endre A.; and Leshchiner, Adolf, to Biomatrix, Inc. Hyaluronate modified polymeric articles. 4,500,676, Cl. 525-54.200.

Ballheimer, Benny, to Caterpillar Tractor Co. Coupling of driving member to driven member. 4,499,786, Cl. 74-606.00R.

Balogh, Alojz: *See*—
Durmis, Julius; Balogh, Alojz; Karvas, Milan; Hrachovcova, Maria; Masek, Jan; Caucik, Pavol; and Povazancova, Marta, 4,500,446, Cl. 252-403.000.

Balz, Gunther W., to Roto-Finish Company, Inc. Dual motion vibratory finishing machine and method. 4,499,692, Cl. 51-313.000.

Ban, Yasutaka; and Osada, Toshihiko, to Fujitsu Limited. Electron beam exposing method. 4,500,789, Cl. 250-492.200.

Bando Chemical Industries, Ltd.: *See*—
Wada, Noriaki, 4,500,666, Cl 524-232.000.

Barber, Ralph R.; and Schultze, Eckart F., to Duff-Norton Co. Hydraulic directional control valve. 4,500,069, Cl. 251-282.000.

Barme, Michel, to Institut Pasteur. Stabilizing agents for live viruses for preparing vaccines, and stabilized vaccines containing said stabilizing agents. 4,500,512, Cl. 424-89.000.

Barnum, Dean C.: *See*—
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,499,955, Cl. 175-46.000.
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,499,956, Cl. 175-46.000.

Baron, Kenneth: *See*—
Simpson, Howard D.; Richardson, Ryden L.; and Baron, Kenneth, 4,500,424, Cl. 208-216.0PP.

Barone, Domenico: *See*—
Winters, Giorgio; Sala, Alberto; and Barone, Domenico, 4,500,525, Cl. 514-210.000.

Bartee, Gary E.: *See*—
Hoyt, Robert M.; Bobbitt, Donald E.; Bartee, Gary E.; Garton, Stanley C.; and Pilliard, J. Paul, 4,499,698, Cl. 52-157.000.

Barton, Jeffrey N.: *See*—
Suh, John T.; Barton, Jeffrey N.; and Regan, John R., 4,500,713, Cl. 546-165.000.

Barzaghi, Fernando: *See*—
Bianchi, Mario; and Barzaghi, Fernando, 4,500,731, Cl. 514-452.000.

Basalay, Robert J.: *See*—
West, C. Thomas; and Basalay, Robert J., 4,500,439, Cl. 252-46.400.

BASF Aktiengesellscaft: *See*—
Kubinyi, Hugo; Traut, Martin; and Gries, Josef, 4,500,467, Cl. 514-2.000.

BASF Aktiengesellschaft: *See*—
Becker, Rainer; Theobald, Hans; Schirmer, Ulrich; Spiegler, Wolfgang; Seufert, Walter; and Wuerzer, Bruno, 4,500,340, Cl. 71-90.000.

Bates, William L.: *See*—
McWhorter, Fred A.; and Bates, William L., 4,500,110, Cl. 280-680.000.

Bateson, Norman E., to Norson Industries, Inc. Pneumatic gate for railway hopper cars. 4,500,230, Cl. 406-131.000.

Battenfeld Maschinenfabriken GmbH: *See*—
Cyriax, Wilhelm; Tamboers, Gerhard; and Holzschuh, Johannes, 4,500,274, Cl. 425-185.000.

Bauer, James J.: *See*—
Trusock, George J.; Bauer, James J.; and Gandhi, Bhupen, 4,500,819, Cl. 318-106.000.

Baumann, Theodor; and Schreyegg, Otmar, to Philipp Holzmann Aktiengesellschaft. Moulding device for sub-soil curtain wall sections. 4,499,699, Cl. 52-169.100.

Baumer, Klaus; and Wiegand, Herbert, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Injection device for direct injection diesel engines using alcohol and diesel fuel. 4,499,862, Cl. 123-1.00A.

Baumer, Klaus: *See*—
Wiegand, Herbert; and Baumer, Klaus, 4,499,861, Cl. 123-1.00A.

Baumgartner, Charles E.: *See*—
Karas, Bradley R.; and Baumgartner, Charles E., 4,500,566, Cl. 427-115.000.

Bausch & Lomb Incorporated: *See*—
Stevens, Donn E., 4,500,180, Cl. 351-234.000.

Baxter, Jack L.: *See*—
Sermersheim, DeWayne T.; and Baxter, Jack L., 4,500,303, Cl. 474-112.000.

Baxter Travenol Laboratories, Inc.: *See*—
Kulin, Ralph; Granzow, Daniel B.; and Danielsen, Brant R., 4,500,788, Cl. 250-455.100.

Bayer Aktiengesellschaft: *See*—
Elbe, Hans-Ludwig; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,500,537, Cl. 514-383.000.
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert R., 4,500,341, Cl. 71-92.000.
Furstenwerth, Hauke, 4,500,715, Cl. 548-140.000.
Goyert, Wilhelm; Grimm, Wolfgang; Awater, Albert; Wagner, Hans; and Kruger, Bruno, 4,500,671, Cl. 524-494.000.
Hausmann, Heinz; Niessen, Heinz J.; Telle, Otto; and Neumaier, Hermann, 4,500,348, Cl. 71-103.000.
Kinast, Gunther, 4,500,716, Cl. 548-196.000.
Meussdoerffer, Johann-Nikolaus; Niederprum, Hans; Nieder-Vahrenholz, Hans-Georg; and Bockelmann, Wolfgang, 4,500,350, Cl. 75-1.00R.
Ostlinning, Edgar; and Idel, Karsten, 4,500,702, Cl. 528-388.000.
Rasshofer, Werner; and Prolingheuer, Ernst-Christoph, 4,500,656, Cl. 521-164.000.

BBC Aktiengesellschaft Brown, Boveri & Cie: *See*—
Nicoll, Andrew R., 4,500,489, Cl. 420-445.000.

BBC Brown, Boveri & Company, Limited: *See*—
Mayer, Andreas; and Niederer, Adolf, 4,500,260, Cl. 417-64.000.
Moser, Peter, 4,499,731, Cl. 60-602.000.

Beane, Michael J., to Liquidometer Corporation. Inductively-coupled signalling system. 4,500,881, Cl. 340-825.730.

Beardmore, David H., to Phillips Petroleum Company. Burning of fuels. 4,500,281, Cl. 431-3.000.

Beck, Ernst; Lenard, Peter; and Pokorny, Erich, to Vollmer Werke Maschinenfabrik GmbH. Machine for machining circular saw blades. 4,499,794, Cl. 76-75.000.

Becker, Herbert: *See*—
Leistner, Rolf; and Becker, Herbert, 4,499,787, Cl. 74-625.000.

Becker, Rainer; Theobald, Hans; Schirmer, Ulrich; Spiegler, Wolfgang; Seufert, Walter; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Urea derivatives and their use for controlling undesirable plant growth. 4,500,340, Cl. 71-90.000.

Beckman, Robert F.: *See*—
Hennekes, Daniel M.; Suica, David E.; and Beckman, Robert F., 4,500,065, Cl. 248-542.000.

Becton, Dickinson and Company: *See*—
Christinger, Werner, 4,500,310, Cl. 604-228.000.

Beekman, Stewart M. Process for preparing basic aluminum carbonate gels substantially free from foreign anions and fibrous colloidal alumina monohydrate of a boehmite crystal lattice structure. 4,500,444, Cl. 252-315.700.

Bege, Dietmar: *See*—
Kuhnke, Klaus; Bege, Dietmar; Puthawala, Anwer; and Witrowsky, Gunter, 4,500,449, Cl. 252-628.000.

Behar, Marvin L. Picnic basket. 4,499,999, Cl. 206-546.000.

Behringwerke Aktiengesellschaft: *See*—
Bohn, Hans; and Kraus, Walter, 4,500,451, Cl. 260-112.00R.

Beikman, Douglas L. Apparatus and method of handling bales. 4,500,242, Cl. 414-24.500.

Beisswenger, Siegfried, to Dr. -Ing. Rudolf Hell GmbH. High stability electron beam generator for processing material. 4,500,791, Cl. 250-493.100.

Bell, Raymond J.: *See*—
Poole, John S.; Gere, Dennis R.; Bell, Raymond J.; and Nickerson, Mark A., 4,500,432, Cl. 210-659.000.

Belorussky Nauchnoisledovatelsky Institut Kardiologii: *See*—
Sidorenko, Georgy I.; Lopato, Georgy P.; Yakubovich, Vladimir M.; Nikitin, Yaroslav G.; Usachev, Oleg I.; and Vorobiev, Anatoly P., 4,499,904, Cl. 128-703.000.

Belttari, Stanley C.: *See*—
Jacobson, Mark K.; and Belttari, Stanley C., 4,500,232, Cl. 408-153.000.

Ben Clements & Sons, Inc.: *See*—
Furutsu, Akira, 4,499,928, Cl. 140-93.200.

Bender, Fredric G.; Everson, Charles W.; and Swartz, William E., to Stauffer Chemical Company. Method of increasing the organoleptic acceptability of shank meat. 4,500,559, Cl. 426-646.000.

Bendix Corporation, The: *See*—
de Campos, Hugo N., 4,500,144, Cl. 384-463.000.
Gaiser, Robert F., 4,499,729, Cl. 60-578.000.

Woo, Ji Y., 4,500,111, Cl. 280-688.000.

Bennett, Donald B.; Thorsrud, Lee T.; and Petschauer, Thomas W., to Sperry Corporation. VLSI Wired-OR driver/receiver circuit. 4,500,988, Cl. 370-85.000.

Bennett, William G.; and Spease, Arthur L., to Teleflex Incorporated. Molded ball socket terminal (connecting belts). 4,499,785, Cl. 74-501.00R.

Benz, Karl; and Kech, Gunter, to VEGA Grieshaber GmbH & Co. KG. Device for the determination and/or control of a certain charging level in a container. 4,499,765, Cl. 73-290.00V.

Berger, Richard M., to American Filtrona Corporation. Free air dilution smoke filter and method and apparatus for fabricating same. 4,499,912, Cl. 131-336.000.

Bergeron, Ned; and Stollberg, Theodore A., to B.W.B. Controls, Inc. Plunger and transparent indicator. 4,499,846, Cl. 116-272.000.

Bergeson, Lloyd: *See*—
Lord, John G., 4,499,841, Cl. 114-98.000.

Bernard, Daniel: *See*—
Broussoux, Dominique; Facoetti, Hugues; Ravinet, Pierre; Bernard, Daniel; and Micheron, Francois, 4,500,377, Cl. 156-164.000.

Bernardi, Luigi; Temperilli, Aldemio; Ruggieri, Daniela; Arcari, Giuliana; and Salvati, Patricia, to Farmitalia Carlo Erba S.p.A. Ergoline derivatives. 4,500,712, Cl. 546-67.000.

Berry, Jean-Luc, to S.I.C.A. Pulposec de Chevrieres. Continuous press, in particular for pressing beet pulp and other juice-containing materials. 4,499,823, Cl. 100-121.000.

Berthel, Robert O.: *See*—
Plank, Vernon G.; Matthews, Anthony J.; Berthel, Robert O.; and LaGross, Dennis L., 4,499,761, Cl. 73-170.00R.

Bertram, Leo: *See*—
Schemmann, Hugo; and Bertram, Leo, 4,500,825, Cl. 318-792.000.

Bertsch, Jack, to Polytronics, Inc. Electrical connector device. 4,500,160, Cl. 339-166.00R.

Berwind Corporation: *See*—
Brenton, Ronald G.; and Runck, Robin B., 4,499,640, Cl. 29-25.410.
Fathauer, George H.; and Hood, Charles F., 4,499,766, Cl. 73-304.00C.
Fathauer, George H.; Hood, Charles F.; and Runck, Robin B., 4,499,767, Cl. 73-304.00C.
Fleckenstein, Phillip P., 4,499,641, Cl. 29-25.410.

Bessaguet, Louis: *See*—
Astier, Jean-Francois; Bessaguet, Louis; and Laplanche, Michel, 4,500,272, Cl. 425-78.000.
Astier, Jean-Francois; Bessaguet, Louis; and LaPlanche, Michel, 4,500,280, Cl. 425-569.000.

Bessay, Raymond; and Riollet, Gilbert, to Alsthom-Atlantique. Guide blade set for diverging jet streams in a steam turbine. 4,500,256, Cl. 415-191.000.

Bessay, Raymond: *See*—
Riollet, Gilbert; and Bessay, Raymond, 4,500,070, Cl. 251-282.000.

Beta Engineering & Development Ltd.: *See*—
Porat, Chaim; and Sadeh, Yaacov, 4,500,873, Cl. 340-515.000.

Bethlehem Steel Corporation: *See*—
Hart, Robert G.; and Townsend, Herbert E., 4,500,399, Cl. 204-181.00C.

Beuhler, Allyson J.: *See*—
Polak, Anthony J.; and Beuhler, Allyson J., 4,500,667, Cl. 524-406.000.

Beyer, Henry R.; DeSipio, Richard G.; Long, Thomas F.; and Ritz, Joseph, to United States of America, Navy. Data link data and address recognition. 4,500,885, Cl. 343-456.000.

Beyer, Henry R.: *See*—
Naubereit, Henry; Beyer, Henry R.; DeSipio, Richard G.; and Picard, Salvatore R., 4,500,884, Cl. 343-456.000.

BF Goodrich Company, The: *See*—
Rundo, John R., 4,499,703, Cl. 52-746.000.

Bialkowski, Wojciech L., to Domtar Inc. Paper machine wet line control. 4,500,968, Cl. 364-471.000.

Bianchi, Mario; and Barzaghi, Fernando, to Roussel Uclaf. Derivatives of 4-phenyl-4-oxobuten-2-oic acid, pharmaceutical compositions containing them, and therapeutic uses for them. 4,500,731, Cl. 514-452.000.

Bieringer, Robert J., to Owens-Illinois, Inc. Method and apparatus for inspecting articles. 4,500,203, Cl. 356-240.000.

Bieringer, Ulrich: *See*—
Napp, Gerhard; Bieringer, Ulrich; Kreismer, Heinz; and Goseberg, Walter, 4,500,833, Cl. 323-359.000.

Biffle, Morris S. High pressure rotary stripper. 4,500,094, Cl. 277-31.000.

Bildusas, Leon L. Resealable articles and process. 4,500,021, Cl. 225-49.000.

Biller, Cleveland J.: *See*—
Peters, Penn A.; Biller, Cleveland J.; and Johnson, David D., 4,500,004, Cl. 212-80.000.

Billingsley, Henry C.; and Clark, Amos M., to Outboard Marine Corporation. Dual fuel supply system. 4,499,887, Cl. 123-575.000.

Bindel, Rudolf; and Ruoff, Eugen, to Elring Dichtungswerke GmbH. Cylinder head gasket. 4,500,100, Cl. 277-235.00B.

Binnig, Gerd K.; and Gerber, Christoph E., to International Business Machines Corporation. Method and dilution refrigerator for cooling at temperatures below 1° K. 4,499,737, Cl. 62-56.000.

Biomatrix, Inc.: *See*—
Balazs, Endre A.; and Leshchiner, Adolf, 4,500,676, Cl. 525-54.200.

Biomelktechnik Hoefelmayr & Co.: *See*—
Hoefelmayr, Tilman; and Maier, Jakob, 4,499,854, Cl. 119-14.320.

Bion Corporation: *See*—
Roberts, Michael K.; Ottosen, Richard A.; and McConnell, Matthew L., 4,499,771, Cl. 73-632.000.

BioResearch Inc.: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph, 4,500,308, Cl. 604-4.000.

Birdwell, J. C. Mud pump. 4,500,267, Cl. 417-552.000.

Bitting, Ricky F.; and Peil, William, to General Electric Company. Speed or torque control circuit for an electronically commutated motor (ECM) and method of controlling the torque or speed of an ECM. 4,500,821, Cl. 318-254.000.

Bittler, Dieter: *See*—
Nickisch, Klaus; Bittler, Dieter; Laurent, Henry; Wiechert, Rudolf; and Losert, Wolfgang, 4,500,522, Cl. 514-173.000.

Blachman, Marc W.: *See*—
Burrington, James D.; and Blachman, Marc W., 4,500,468, Cl. 260-465.80D.

Blackwood, John; Graham, Thomas G.; and Brauch, Robert B., to Singer Company, The. Reverse feed controlling mechanism for a sewing machine. 4,499,839, Cl. 112-317.000.

Blaisdell, Ronald G.; and Gagnon, Peter R., to GTE Products Corporation. One-piece frame for an electric lamp. 4,500,948, Cl. 362-382.000.

Blake, Frederick H. Lighting circuit control apparatus. 4,500,814, Cl. 315-323.000.

Blakeslee, A division of Blako, Inc.: *See*—
Vilen, Erik O., 4,500,210, Cl. 366-207.000.

Blenkush, Brian J., to Colder Products Company. Fitting apparatus for soft tubing. 4,500,118, Cl. 285-247.000.

Bloome, James A.; Meeker, Rick A.; Whicker, Jerry T.; and Foreman, Frederick J., to Kartridg Pak Company, The. Portable polisher. 4,499,624, Cl. 15-97.00R.

Bloomer, Milton D., to General Electric Company. Current sensor. 4,500,838, Cl. 324-117.00R.

Bluthgen, Bjorn, to Polygram GmbH. Method for eliminating unwanted acoustic signals in audio programs to be edited for reproduction. 4,501,014, Cl. 381-94.000.

Blytas, George C., to Shell Oil Company. Aqueous electrolyte desiccation of substantially supercritical CO_2. 4,500,333, Cl. 62-17.000.

Bobbitt, Donald E.: *See*—
Hoyt, Robert M.; Bobbitt, Donald E.; Bartee, Gary E.; Garton, Stanley C.; and Pilliard, J. Paul, 4,499,698, Cl. 52-157.000.

Bobrov, Anatoly D.: *See*—
Eschenko, Vladislav Y.; Musaev, Irsali K.; Talibdzhanov, Zakhidzhan S.; Leonov, Viktor A.; Bobrov, Anatoly D.; Kirovsky, Efim I.; Gritsenko, Vladimir A.; and Golovanov, Alexandr V., 4,500,282, Cl. 431-184.000.

Bobst SA: *See*—
Anastasio, Frank J.; and Byro, Thomas, 4,499,831, Cl. 101-152.000.
Lucas, Raymond, 4,500,022, Cl. 225-97.000.

Bockelmann, Wolfgang: *See*—
Meussdoerffer, Johann-Nikolaus; Niederprum, Hans; Nieder-Vahrenholz, Hans-Georg; and Bockelmann, Wolfgang, 4,500,350, Cl. 75-1.00R.

Bockwinkel, Joe L.; and Pehl, Willis G., to Shakertown Corporation. Rabbeted shingle butt joint sidewall panel and shingle component. 4,499,701, Cl. 52-555.000.

Boda, James C., to Brunswick Corporation. Adjustable control linkage. 4,499,780, Cl. 74-107.000.

Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. 1-Hydroxymethyl cyclopropanes organoleptic use of same. 4,500,448, Cl. 252-522.00R.

Bodge, Kevin R.; and Dean, Robert G., to University of Delaware. Water wave monitor. 4,499,762, Cl. 73-170.00A.

Boeing Company, The: *See*—
Williams, John W., 4,499,843, Cl. 114-280.000.

Bohn; Hans; and Kraus, Walter, to Behringwerke Aktiengesellschaft. New protein PP_{13} extracted from human placental tissues and use thereof. 4,500,451, Cl. 260-112.00R.

Boisot, Yves: *See*—
Malbec, Yves; Boisot, Yves; Bontemps, Daniel; and Duhamel, Georges, 4,500,760, Cl. 200-83.00C.

Bolger, Thomas V., to RCA Corporation. FIR Chrominance bandpass sampled data filter with internal decimation. 4,500,912, Cl. 358-31.000.

Bolton, John D. Jet power lawn mower. 4,499,710, Cl. 56-11.900.

Bolton, Theodore S.; Leech, Brad G.; and Lang, Richard D., to Carrier Corporation. Discharge air assembly for a room air conditioner. 4,499,816, Cl. 98-40.260.

Bond, Armand P.; Poznansky, Abraham; and Grobner, Paul J., to Amax Inc. Cast duplex stainless steel. 4,500,351, Cl. 75-128.00N.

Bongrain S.A.: *See*—
Chauvin, Bernard, 4,500,550, Cl. 426-38.000.

Bontemps, Daniel: *See*—
Malbec, Yves; Boisot, Yves; Bontemps, Daniel; and Duhamel, Georges, 4,500,760, Cl. 200-83.00C.

Bordages, John W., to Texaco Inc. Internal gripping pipe wrench. 4,499,799, Cl. 81-446.000.

Bordogna O. & C., Macpi S.p.A.: *See*—
Cartabbia, Giovanni, 4,499,677, Cl. 38-28.000.

Borel, Georg, to Hermann Wangner GmbH & Co KG. Two-ply screen for the sheet forming zone of a papermaking machine. 4,499,927, Cl. 139-425.00A.

Boremaster Precision Tool & Mfg.: *See*—
Jacobson, Mark K.; and Belttari, Stanley C., 4,500,232, Cl. 408-153.000.

Borg, Sidney: *See*—
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,500,428, Cl. 210-609.000.

Bornowski, Gunter: *See*—
Girodi, Erich; Bornowski, Gunter; Dejmek, Eberhard; Knabe, Andreas; Koch, Roland; Urbach, Bernd; and Weisselberg, Arnold, 4,500,764, Cl. 219-59.100.

Bornzin, Gene A.: *See*—
Kallok, Michael J.; and Bornzin, Gene A., 4,499,907, Cl. 128-786.000.

Borzym, Alexander: *See*—
Borzym, John J.; and Borzym, Alexander, 4,499,803, Cl. 83-319.000.

Borzym, John J.; and Borzym, Alexander, to Alpha Industries, Inc. Double cut die set with improved pull-across notching feature. 4,499,803, Cl. 83-319.000.

Boseki Kabushiki Kaisha: *See*—
Mitomi, Takeshi; Yoshimura, Eiji; and Komagata, Hideki, 4,500,581, Cl. 428-85.000.

Bosselaers, Robert J.; and Elder, Richard B., to United States of America, Army. Frequency modulated phase locked loop. 4,500,857, Cl. 332-9.00R.

Boston University, Trustees of: *See*—
Catsimpoolas, Nicholas, 4,500,524, Cl. 514-250.000.

Bottomley, C. Edward. Two-way gun cleaner tip and butterfly path for use therewith. 4,499,625, Cl. 15-104.165.

Boucher, John H. Method of treating horses to inhibit or reduce increases in crenated red blood cells during exercise. 4,500,530, Cl. 514-255.000.

Boulais, Richard A.: *See*—
Daemmer, Johnathan E., 4,500,970, Cl. 364-513.000.

Boulva, Paul. Paddle wheel propelled watercraft. 4,500,297, Cl. 440-27.000.

Boundy, Bruce K.: *See*—
Anderson, William C.; Boundy, Bruce K.; and Schoumaker, Raoul J. P., 4,500,060, Cl. 248-349.000.

Bourgery, Guy R.: *See*—
Platel, Alain Y.; Lacour, Alain P.; and Bourgery, Guy R., 4,500,531, Cl. 514-255.000.

Boutros, Kamal S.: *See*—
Briones, Francisco R.; and Boutros, Kamal S., 4,500,159, Cl. 339-147.00R.

Bova, Joseph D. Method and apparatus for continuous production of expandable honeycomb. 4,500,380, Cl. 156-197.000.

Bower, George L.: *See*—
Ellenberger, Charles E.; Bower, George L.; and Snow, William R., 4,500,563, Cl. 427-38.000.

Boys, Donald R.; and Graves, Walter E., to Varian Associates, Inc. Disk or wafer handling and coating system. 4,500,407, Cl. 204-298.000.

Boys, Donald R.; and Smith, Robert M., to Varian Associates, Inc. Apparatus for and method of controlling sputter coating. 4,500,408, Cl. 204-298.000.

Boys, Donald R.; and Graves, Walter E., to Varian Associates, Inc. Magnetron sputter coating source for both magnetic and non magnetic target materials. 4,500,409, Cl. 204-298.000.

Bozzone, Richard T., Sr.: *See*—
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,500,428, Cl. 210-609.000.

Bradburn, Ronald G.: *See*—
Austin, James W.; Bradburn, Ronald G.; Cromwell, Clarence A.; Gratch, Eitan; Groiss, Erich; Perkins, Derek; and Walker, Robert A., 4,500,496, Cl. 423-55.000.

Bradbury, Allan G.: *See*—
Fulger, Charles V.; and Bradbury, Allan G., 4,500,558, Cl. 426-622.000.

Bradley, Wilson E., Jr.; and Rye, Palle, to Evapco, Inc. Drift eliminator. 4,500,330, Cl. 55-257.0PV.

Braga, Thomas G.: *See*—
French, Eddie; and Braga, Thomas G., 4,500,445, Cl. 252-387.000.

Braitsch, Hans; Ortwein, Hermann; and Vorwald, Josef, to Clouth Gummiwerke Aktiengesellschaft. Railway road bed. 4,500,037, Cl. 238-2.000.

Branco, Antonio: *See*—
Ford, James M.; Dean, Robert A.; Woodard, Kenneth E., Jr.; and Branco, Antonio, 4,500,379, Cl. 156-172.000.

Brand, Rolf. Propeller and engine mounting device. 4,500,053, Cl. 244-54.000.

Brandes, Wilhelm: *See*—
Elbe, Hans-Ludwig; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,500,537, Cl. 514-383.000.

Brandigampola, Don E., to Valcom Limited. Antenna construction. 4,500,888, Cl. 343-873.000.

Brassell, Gilbert W.; and Brugger, Ronald P., to Brassell, Gilbert W. Bonded carbon or ceramic fiber composite filter vent for radioactive waste. 4,500,328, Cl. 55-97.000.

Bratt, Christer, to United Stirling AB. Heater head for a multi-cylinder hot gas engine. 4,499,726, Cl. 60-517.000.

Brauch, Robert B.: *See*—
Blackwood, John; Graham, Thomas G.; and Brauch, Robert B., 4,499,839, Cl. 112-317.000.

Braun, William V.: *See*—
Shanley, Charles W.; and Braun, William V., 4,501,018, Cl. 455-83.000.

Brecker, Lawrence R.; and Keeley, Charles, to Argus Chemical Corporation. Codispersed particulate lubricant stabilizer compositions for synthetic resins. 4,500,665, Cl. 524-227.000.

Breedis, John F.; and Fister, Julius C., to Olin Corporation. Method of forming a composite material having improved bond strength. 4,500,028, Cl. 228-117.000.

Breedis, John F.: *See*—
Fister, Julius C.; and Breedis, John F., 4,500,605, Cl. 428-469.000.

Brenda Mines Ltd.: *See*—
Austin, James W.; Bradburn, Ronald G.; Cromwell, Clarence A.; Gratch, Eitan; Groiss, Erich; Perkins, Derek; and Walker, Robert A., 4,500,496, Cl. 423-55.000.

Brendling, Lennart I. Collapsible urinal drop collector applicator. 4,500,314, Cl. 604-346.000.

Brennan, Gerald J. Chimney flue insertion apparatus. 4,500,078, Cl. 269-46.000.

Brennan, Michael E., to Texaco Inc. Alkoxylated modified Mannich condensates and manufacture of rigid polyurethane foams therewith. 4,500,655, Cl. 521-163.000.

Brenton, Ronald G.; and Runck, Robin B., to Berwind Corporation. Method of manufacturing capacitance-type material level indicator probe. 4,499,640, Cl. 29-25.410.

Bretscher, Erwin; and Vettiger, Peter, to International Business Machines Corporation. System for improving the uniformness of patterns generated by electron beam lithography. 4,500,790, Cl. 250-492.200.

Brian Davis and Company Proprietary Limited: *See*—
Carlson, Arthur R., 4,499,998, Cl. 206-541.000.

Bridgeman, Danial N. P. Apparatus for producing continuous bags of thin wall material. 4,500,307, Cl. 493-196.000.

Bridgestone Tire Company Limited: *See*—
Ogawa, Masaki; and Shiomura, Yasuro, 4,500,685, Cl. 525-343.000.

Briesemeister, Richard A.: *See*—
Paulson, Bernard S.; Paulson, Bruce H.; Clark, Brian K.; and Briesemeister, Richard A., 4,499,992, Cl. 198-498.000.

Brimfield Precision, Inc.: *See*—
Lyons, William G., III, 4,499,899, Cl. 128-305.000.

Brinkworth, Robert T.: *See*—
Katsen, Boris J.; Brinkworth, Robert T.; Kay, Daniel J.; and Riester, James A., 4,500,354, Cl. 106-21.000.

Briones, Francisco R.; and Boutros, Kamal S., to Allied Corporation. Filter electrical connector. 4,500,159, Cl. 339-147.00R.

Brisabois, Roger, to Regie Nationale des Usines Renault. Automotive vehicle drive train. 4,499,791, Cl. 74-700.000.

Bristol-Myers Company: *See*—
Imae, Kiyoto; Aburaki, Shimpei; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, 4,500,526, Cl. 514-226.000.

Britten, Roy J.; and Davidson, Eric H., to California Institute of Technology. Large area spark chamber and support, and method of recording and analyzing the information on a radioactive work piece. 4,500,786, Cl. 250-389.000.

Brochman, Wilfred R., to Minnesota Mining and Manufacturing Company. Tape closure for a can end. 4,500,011, Cl. 220-359.000.

Broderna Holmbergs Fabriks AB: *See*—
Elwing, Ben; Foldi, Peter; and Holmberg, Gote, 4,499,824, Cl. 100-48.000.

Brose Fahrzeugteile GmbH und Co.: *See*—
Leistner, Rolf; and Becker, Herbert, 4,499,787, Cl. 74-625.000.

Brothers, Lance E.; and Rao, S. Prabhakara, to Halliburton Company. Oil field cementing methods and compositions. 4,500,357, Cl. 106-90.000.

Broussoux, Dominique; Facoetti, Hugues; Ravinet, Pierre; Bernard, Daniel; and Micheron, Francois, to Thomson-CSF. Process for the production of a block of piezoelectric macromolecular material. 4,500,377, Cl. 156-164.000.

Brown, Christopher K.; Kensinger, Lex D.; Over, William R.; and Wion, Donald A., to AMP Incorporated. Automatic wiring apparatus with rotatable insertion tooling. 4,499,648, Cl. 29-564.200.

Brown, Karen K.; and Stewart, Richard C., to Miles Laboratories, Inc. Influenza vaccine production in liquid cell culture. 4,500,513, Cl. 424-89.000.

Brown, Patrick C., to Corning Glass Works. Low tension winding apparatus. 4,500,043, Cl. 242-45.000.

Brugger, Ronald P.: *See*—
Brassell, Gilbert W.; and Brugger, Ronald P., 4,500,328, Cl. 55-97.000.

Brunet, Maurice, to Societe Europeenne de Propulsion. Magnetic suspension device of a rotor placed in a sealed enclosure. 4,500,142, Cl. 308-10.000.

Brunswick Corporation: *See*—
Boda, James C., 4,499,780, Cl. 74-107.000.

Bruttel, Beat: *See*—
Hugelshofer, Paul; Bruttel, Beat; Pfenninger, Heinz; and Lacroix, Roger, 4,500,321, Cl. 8-527.000.

Bryant, Clifford A.: *See*—
Pacifici, Joseph A.; and Bryant, Clifford A., 4,500,039, Cl. 239-193.000.

Buan, Danilo P.; and Eckert, Alton B., to Pitney Bowes Inc. Apparatus and method for aligning postage meter components with an optical sensor. 4,500,780, Cl. 250-231.0SE.

Bucek, Francis J.; and Paxhia, Frank V., to International Business Machines Corporation. Storage apparatus for video data. 4,500,928, Cl. 358-296.000.

Buchel, Karl H.: *See*—
Elbe, Hans-Ludwig; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,500,537, Cl. 514-383.000.

Buck, Roy T.; Cloutier, Frank L.; Erni, R. Ernst; Low, Robert N.; and Terry, F. Duncan, to Hewlett-Packard Company. Disposable ink jet head. 4,500,895, Cl. 346-140.00R.
Buckle, Ian G.; and Built, Steven M., to Development Finance Corporation of New Zealand. Cyclic shear energy absorber. 4,499,694, Cl. 52-167.000.
Buckley, B. Shawn: *See*—
Buckley, Bruce S., 4,499,894, Cl. 126-450.000.
Buckley, Bruce S., to Buckley, B. Shawn. Passive solar water heater support box. 4,499,894, Cl. 126-450.000.
Budd Company, The: *See*—
Hull, Frederick H., 4,499,759, Cl. 73-146.000.
Buechler, Lester W. Method of engraving an invisible joint within a gravure printing cylinder. 4,500,929, Cl. 358-299.000.
Buffone, Louis A.: *See*—
Krohn, David A.; Buffone, Louis A.; and Vinarub, Edmond I., 4,500,870, Cl. 340-347.00P.
Built, Steven M.: *See*—
Buckle, Ian G.; and Built, Steven M., 4,499,694, Cl. 52-167.000.
Bullis, Robert H.; and Couch, Robert P., to United Technologies Corporation. Emitted ion surge/stall detection. 4,499,755, Cl. 73-116.000.
Bullock, Lance W.; Vlahek, Josip; and Kovacs, Ferenc, to W. R. Grace Australia Limited. Apparatus for thermoforming thermoplastic sheet materials. 4,500,277, Cl. 425-387.100.
Burkarth, Jack L., to Gulton Industries, Inc. Air diffuser. 4,499,815, Cl. 98-40.140.
Burn, William H., to Crescent Hosiery Mills. Crew sock with nonroll selvage top. 4,499,742, Cl. 66-172.00E.
Burns, Richard H.; Hall, William M.; and Hildebrand, Bernard P., to Singer Company, The. Holographic projection screen. 4,500,163, Cl. 350-3.700.
Burow, Kenneth W., Jr., to Eli Lilly and Company. Oxazolyl and thiazolyl amides as herbicides. 4,500,343, Cl. 71-76.000.
Burrington, James D.; and Blachman, Marc W., to Standard Oil Company, The. Catalytic dimerization of acrylonitrile. 4,500,468, Cl. 260-465.80D.
Burroughs Corporation: *See*—
Rayfield, Wilson P.; Peter, Emmett B., III; and Shultz, Richard E., 4,500,085, Cl. 271-207.000.
Burroughs Wellcome Co.: *See*—
Wisowaty, James C.; Swaringen, Roy A.; and Yeowell, David A., 4,500,711, Cl. 544-258.000.
Bussey, Harry, Jr. Billowed filling elements for packaging. 4,500,586, Cl. 428-174.000.
Byro, Thomas: *See*—
Anastasio, Frank J.; and Byro, Thomas, 4,499,831, Cl. 101-152.000.
C. Reichert Optische Werke, AG: *See*—
Tvedt, Kare E.; Kopstad, Guennar; and Haugen, Olav A., 4,499,670, Cl. 34-143.000.
C. S. Norcross & Sons: *See*—
Norcross, Charles E., 4,499,978, Cl. 188-79.50K.
Cadee , Theodorus P. M., to Van Doorne's Transmissie B.V. Apparatus for controlling the transmission ratio of an infinitely variable transmission. 4,500,301, Cl. 474-28.000.
Calabro, Philip. Mast support assembly. 4,500,064, Cl. 248-539.000.
California Institute of Technology: *See*—
Britten, Roy J.; and Davidson, Eric H., 4,500,786, Cl. 250-389.000.
Calvet, Pierre; and Platet, Bernard, to Office National d'Etudes et de Recherche Aerospatiales. Apparatus for the continuous measurement of the heating power of a gas. 4,500,214, Cl. 374-36.000.
Cambio, Orlando D., Jr., to Respiratory Care, Inc. Pediatric cartridge humidifier. 4,500,480, Cl. 261-104.000.
Campanella, Samuel J.: *See*—
Virupaksha, Krishnamoorthy; and Campanella, Samuel J., 4,501,001, Cl. 375-30.000.
Campbell, Donald N.: *See*—
Schmidt, John C.; Sands, Cliflon A.; and Campbell, Donald N., 4,500,391, Cl. 204-1.00T.
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., to Chevron Research Company. Battery powered means and method for facilitating measurements while coring. 4,499,955, Cl. 175-46.000.
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., to Chevron Research Company. Locking means for facilitating measurements while coring. 4,499,956, Cl. 175-46.000.
Campoli, Alan A.; and Garcia, Fred, to United States of America, Interior. Self-actuating vacuum gas/liquid separator. 4,500,329, Cl. 55-189.000.
Canada, Her Majesty in Right of: *See*—
Wakeman, Philip E. D., 4,501,020, Cl. 455-226.000.
Canadian Fram Limited: *See*—
Charles, Herbert N., 4,499,865, Cl. 123-41.050.
Canamero, Ernest V.: *See*—
Cherkasky, Miles R.; and Canamero, Ernest V., 4,500,276, Cl. 425-297.000.
Cannavo, Glenn M.: *See*—
Gerteisen, Steven R.; Wenger, Richard M.; and Cannavo, Glenn M., 4,500,595, Cl. 428-294.000.
Cannon, Lee E.; and Wilson, Kentner B., to Wilson, Kentner B. Automatic tool changer. 4,499,650, Cl. 29-568.000.
Canon Kabushiki Kaisha: *See*—
Endo, Takashi, 4,500,187, Cl. 354-266.000.
Haraguchi, Shosuke; and Tosaka, Yoichi, 4,500,185, Cl. 354-209.000.
Hashimoto, Seiji; Tanaka, Nobuyoshi; Suga, Akira; and Kuwayama, Tetsuro, 4,500,913, Cl. 358-44.000.
Hosono, Nagao, 4,500,195, Cl. 355-3.00R.
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,500,619, Cl. 430-59.000.
Kitagishi, Nozomu; and Tajima, Akira, 4,500,188, Cl. 354-406.000.
Koumura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, 4,500,918, Cl. 358-75.000.
Sunouchi, Akio; Suzuki, Ryuji; Fujino, Masahisa; and Konno, Tatsuo, 4,500,186, Cl. 354-234.000.
Suzuki, Ryoichi; and Tokuda, Ryuji, 4,500,193, Cl. 354-471.000.
Caporiccio, Gerardo; Viola, Gian T.; and Corti, Costante, to Montedison S.p.A. Process for the insertion of perfluoroolefines on perfluoropolyethers and corresponding products. 4,500,739, Cl. 568-677.000.
Cardenas, Raul: *See*—
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,500,428, Cl. 210-609.000.
Carfer S.r.l.: *See*—
Carraroli, Dario; and Giavelli, Giordano, 4,500,287, Cl. 432-246.000.
Carl Manufacturing Co., Ltd.: *See*—
Mori, Chuzo, 4,499,805, Cl. 83-468.000.
Carlsen, Russell O.; Casati, Francois M.; and Raden, Daniel S., to Abbott Laboratories. Catalyst system and process for the production of polyurethanes. 4,500,654, Cl. 521-129.000.
Carlson, Arthur R., to Brian Davis and Company Proprietary Limited. Food container with removable lid. 4,499,998, Cl. 206-541.000.
Carossino, Andre , to Carossino Freres. Clamp apparatus, especially for clamping a part onto a machine tool. 4,500,081, Cl. 269-93.000.
Carossino Freres: *See*—
Carossino, Andre , 4,500,081, Cl. 269-93.000.
Carr, Kenneth R., to United States of America, Energy. Rotational viscometer for high-pressure high-temperature fluids. 4,499,753, Cl. 73-59.000.
Carraroli, Dario; and Giavelli, Giordano, to Carfer S.r.l.; and Officina Meccanica Giavelli S.p.A. Roller table for single-layer ceramic kilns in general. 4,500,287, Cl. 432-246.000.
Carre , Jean-Jacques: *See*—
Pressaco, Pierre; and Carre , Jean-Jacques, 4,499,812, Cl. 91-376.00R.
Carrier Corporation: *See*—
Bolton, Theodore S.; Leech, Brad G.; and Lang, Richard D., 4,499,816, Cl. 98-40.260.
Carroll, Kenneth M.: *See*—
Ward, William J., III; Ritzer, Alan; Carroll, Kenneth M.; and Flock, John W., 4,500,724, Cl. 556-472.000.
Carroll, Martin J.: *See*—
Fatula, James J., Sr.; and Carroll, Martin J., 4,499,693, Cl. 51-322.000.
Carroll, Robert G.: *See*—
Moore, George W.; and Carroll, Robert G., 4,499,735, Cl. 60-739.000.
Cartabbia, Giovanni, to Bordogna O. & C., Macpi S.p.A. Machine for ironing collars and cuffs. 4,499,677, Cl. 38-28.000.
Carter, William A.: *See*—
Kim, Yong-Wu; Coduti, Phillip L.; Sok, Brian A.; and Carter, William A., 4,500,561, Cl. 427-25.000.
Caruthers, Marvin H.; and Matteucci, Mark D., to University Patents, Inc. Nucleosides useful in the preparation of polynucleotides. 4,500,707, Cl. 536-27.000.
Carver, John H., to Rockwell International Corporation. Asymmetrical time division matrix apparatus. 4,500,986, Cl. 370-58.000.
Casati, Francois M.: *See*—
Carlsen, Russell O.; Casati, Francois M.; and Raden, Daniel S., 4,500,654, Cl. 521-129.000.
Cases, Moises; Kraft, Wayne R.; Stahl, William L., Jr.; and Thoma, Nandor G., to International Business Machines Corporation. Logic performing cell for use in array structures. 4,500,800, Cl. 307-468.000.
Casimir Kast GmbH & Co. KG: *See*—
Reppel, Werner; and Overlack, Claus, 4,500,378, Cl. 156-160.000.
Casio Computer Co., Ltd.: *See*—
Ishida, Hideaki, 4,499,807, Cl. 84-1.030.
Cassar, Luigi: *See*—
Rochat, Alain C.; and Cassar, Luigi, 4,500,718, Cl. 548-471.000.
Cassella Aktiengesellschaft: *See*—
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,500,437, Cl. 252-8.55C.
Cassidy, Dale A.: *See*—
Groh, Edward F.; Cassidy, Dale A.; and Lewandowski, Edward F., 4,500,488, Cl. 376-409.000.
Castner, B. Christian, to Shipley Company Inc. Apparatus for regulating plating solution in a plating bath. 4,499,852, Cl. 118-690.000.
Castonguay, Richard N.: *See*—
King, John J.; Sellers, Ralph F.; and Castonguay, Richard N., 4,500,582, Cl. 428-116.000.
Catalysts & Chemicals Industries Co., Ltd.: *See*—
Fuchikami, Jun; Higashi, Hidehiro; Inoue, Takashi; and Oba, Hiroyuki, 4,500,645, Cl. 502-65.000.
Caterpillar Tractor Co.: *See*—
Ballheimer, Benny, 4,499,786, Cl. 74-606.00R.
Cato Research, Inc.: *See*—
Kruesi, Paul R.; and Kruesi, William H., 4,500,498, Cl. 423-100.000.
Catsimpoolas, Nicholas, to Boston University, Trustees of. Tranquilizing and reducing or preventing seizures. 4,500,524, Cl. 514-250.000.

Caucik, Pavol: *See—*
Durmis, Julius; Balogh, Alojz; Karvas, Milan; Hrachovcova, Maria; Masek, Jan; Caucik, Pavol; and Povazancova, Marta, 4,500,446, Cl. 252-403.000.
Cavallanti, Virginio: *See—*
Lagana', Vincenzo; and Cavallanti, Virginio, 4,500,734, Cl. 564-72.000.
Caverly, John C.: *See—*
Allor, Richard L.; and Caverly, John C., 4,499,646, Cl. 29-447.000.
Cedarstrom, Roy A.: *See—*
Gagnon, Ralph J.; and Cedarstrom, Roy A., 4,500,172, Cl. 350-331.00R.
Cedrone, Nicholas J. Axial lead tester/sorter. 4,500,003, Cl. 209-573.000.
Celanese Corporation: *See—*
Freundlich, Richard A., 4,500,603, Cl. 428-409.000.
Fruchey, Olan S., 4,500,464, Cl. 260-413.000.
Cellucci, Robert: *See—*
Madden, Allan C.; Cellucci, Robert; Hoshida, Robert A.; and MacKay, Duncan, 4,499,768, Cl. 73-462.000.
Central Glass Co., Ltd.: *See—*
Kita, Yasushi; Moroi, Shirou; Sakanoue, Akira; and Nakano, Hisaji, 4,500,678, Cl. 252-58.000.
Cernansky, Joseph S.: *See—*
Rudell, Elliot A.; Shumate, Michael E.; and Cernansky, Joseph S., 4,500,104, Cl. 280-289.00D.
Challenger Caribbean Corporation: *See—*
Sepulveda, Luis F., 4,500,863, Cl. 337-70.000.
Challenger Zinsco, Inc.: *See—*
Sepulveda, Luis F., 4,500,863, Cl. 337-70.000.
Chalmers, Edward L., II, to Lange International S.A. Ski boot. 4,499,676, Cl. 36-120.000.
Cham, Edward J.: *See—*
Specht, Theodore R.; and Cham, Edward J., 4,500,829, Cl. 323-215.000.
Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, to Hoffmann-La Roche Inc. Unsaturated eicosanoic acids. 4,500,462, Cl. 260-405.500.
Chan, Steven S., to Ampex Corporation. Universal interface unit. 4,500,933, Cl. 360-69.000.
Chandler Evans Inc: *See—*
Sundberg, Jack G.; Schaffner, John P.; and Conlon, Daniel J., 4,500,268, Cl. 418-1.000.
Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Catalysis over activated zeolites. 4,500,421, Cl. 208-116.000.
Chang, Clarence D.: *See—*
Miale, Joseph N.; and Chang, Clarence D., 4,500,418, Cl. 208-114.000.
Miale, Joseph N.; and Chang, Clarence D., 4,500,419, Cl. 208-115.000.
Miale, Joseph N.; and Chang, Clarence D., 4,500,420, Cl. 208-116.000.
Miale, Joseph N.; and Chang, Clarence D., 4,500,422, Cl. 208-117.000.
Chang, Ifay F., to International Business Machines Corporation. Full word coding for information processing. 4,500,955, Cl. 364-200.000.
Chang, Joseph J.; and Ramsey, Maynard, III, to Critikon, Inc. Retreated sensing electrode. 4,499,901, Cl. 128-635.000.
Chang, Pei K., to Stauffer Chemical Company. Vegetable protein evidencing improved solution viscosity. 4,500,454, Cl. 260-123.500.
Chang, Shih-Jeh, to AT&T Bell Laboratories. Communication path continuity verification arrangement. 4,500,985, Cl. 370-14.000.
Chardon, Manfred; Mauries, Reinhard; Rohner, Joachim; and Zumfeld, Heinz, to W. Schlafhorst & Co. Method and device for the knot-free connection of two threads. 4,499,715, Cl. 57-22.000.
Charles, Herbert N., to Canadian Fram Limited. Integral engine cooling system. 4,499,865, Cl. 123-41.050.
Chauvin, Bernard, to Bongrain S.A. Cheese with micro-organism—caused decoration on its rind and process for producing same. 4,500,550, Cl. 426-38.000.
Chem-Elec, Inc.: *See—*
Woenker, William E., 4,500,046, Cl. 242-67.10R.
Chemicke zavody Juraja Dimitrova, narodny podnik: *See—*
Durmis, Julius; Balogh, Alojz; Karvas, Milan; Hrachovcova, Maria; Masek, Jan; Caucik, Pavol; and Povazancova, Marta, 4,500,446, Cl. 252-403.000.
Chemische Werke Huls Aktiengesellschaft: *See—*
Disteldorf, Josef; and Gras, Rainer, 4,500,697, Cl. 528-45.000.
Disteldorf, Josef; and Gras, Rainer, 4,500,698, Cl. 528-45.000.
Gras, Rainer, 4,500,696, Cl. 528-45.000.
Chen, Nai Y.; Haag, Werner O.; Huang, Tracy J.; and Wong, Stephen S., to Mobil Oil Corporation. Conversion of Fischer-Tropsch products. 4,500,417, Cl. 208-111.000.
Cheng, Chung-Tsung. Kitchen exhaust apparatus. 4,500,331, Cl. 55-406.000.
Cheng, Dah Y., to International Power Technology, Inc. Control system for Cheng dual-fluid cycle engine system. 4,499,721, Cl. 60-39.050.
Cherkasky, Miles R.; and Canamero, Ernest V., to Cherkasky, Miles R. Apparatus for making deep dish pizza crusts or the like. 4,500,276, Cl. 425-297.000.
Chernack, Milton: *See—*
Greenberg, Mishel; Smyers, William H., Jr.; and Chernack, Milton, 4,499,905, Cl. 128-727.000.
Chesebrough-Pond's Inc.: *See—*
Greenberg, Mishel; Smyers, William H., Jr.; and Chernack, Milton, 4,499,905, Cl. 128-727.000.
Chevalier, Andre , to Institut Francais du Petrole. Plug-in electric connector for use in a liquid medium. 4,500,155, Cl. 339-94.00M.
Chevron Research Company: *See—*
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,499,955, Cl. 175-46.000.
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,499,956, Cl. 175-46.000.
Edwards, Laroy H., 4,500,539, Cl. 514-364.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,500,495, Cl. 423-53.000.
Krug, Russell R.; and Schmidt, Peter C., 4,500,423, Cl. 208-161.000.
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Sato, Akihiro, to Chisso Corporation. High melt-viscoelastic polypropylene for post-processed sheets and for blow molding. 4,500,682, Cl. 525-240.000.
Chichibu Cement Co. Ltd.: *See—*
Nagai, Hiroshi, 4,500,286, Cl. 432-106.000.
Childs, William H., to Communications Satellite Corporation. Simplified minimum shift keying modulator. 4,500,856, Cl. 332-9.00R.
Chisso Corporation: *See—*
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Sato, Akihiro, 4,500,682, Cl. 525-240.000.
Tomioka, Susumu; and Taniguchi, Masahiko, 4,500,384, Cl. 156-290.000.
Yemoto, Jiichiro; Tarao, Ryokichi; and Yamamoto, Yoshio, 4,500,725, Cl. 556-482.000.
Chiu, Herman; S.: *See—*
Nicholson, Myron D.; and Chiu, Herman; S., 4,500,576, Cl. 428-36.000.
Choay, Jean: *See—*
Lormeau, Jean-Claude; Petitou, Maurice; and Choay, Jean, 4,500,519, Cl. 514-56.000.
Choay S.A.: *See—*
Lormeau, Jean-Claude; Petitou, Maurice; and Choay, Jean, 4,500,519, Cl. 514-56.000.
Chorvat, Robert J.; Lenz, George R.; and Evans Radak, Suzanne, to G. D. Serle & Co. Benzothiazine derivatives. 4,500,708, Cl. 544-34.000.
Christensen, Inc.: *See—*
Grappendorf, Richard H.; and West, Jana L., 4,499,959, Cl. 175-330.000.
Christie, Alan M.; and Snyder, Kurt L, to United States of America, Energy. Pressure surge attenuator. 4,500,487, Cl. 376-283.000.
Christinger, Werner, to Becton, Dickinson and Company. Variable sealing pressure plunger rod assembly. 4,500,310, Cl. 604-228.000.
Chu, Wayne S., to Ralston Purina Company. Fish skinning process. 4,500,555, Cl. 426-479.000.
Chugai Seiyaku Kabushiki Kaisha: *See—*
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.
Hosokawa, Tomoyoshi; Matsuura, Ikutoshi; Takahashi, Hidenori; Ando, Kunio; and Tamura, Gakuzo, 4,500,544, Cl. 514-543.000.
Chuo Spring Co., Ltd.: *See—*
Kitagawa, Katsutoshi; Isogai, Kiyoshi; Ohmori, Nobuo; Takita, Naka; Okamoto, Makoto; Koga, Itsuo; and Ito, Kazuo, 4,500,099, Cl. 277-228.000.
Ciba-Geigy Corporation: *See—*
Dittrich, Volker, 4,500,521, Cl. 514-81.000.
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,500,457, Cl. 260-245.20R.
Habicht, Ernst; and Zbinden, Paul, 4,500,542, Cl. 514-465.000.
Hugelshofer, Paul; Bruttel, Beat; Pfenninger, Heinz; and Lacroix, Roger, 4,500,321, Cl. 8-527.000.
Irving, Edward; and Smith, Terence J., 4,500,629, Cl. 430-325.000.
King, John J.; Sellers, Ralph F.; and Castonguay, Richard N., 4,500,582, Cl. 428-116.000.
Martin, Henry, 4,500,347, Cl. 71-97.000.
Rochat, Alain C.; and Cassar, Luigi, 4,500,718, Cl. 548-471.000.
Stockinger, Friedrich; and Haug, Theobald, 4,500,691, Cl. 525-503.000.
Vlattas, Isidoros, 4,500,472, Cl. 260-245.500.
Cincinnati Milacron Inc.: *See—*
Hennekes, Daniel M.; Suica, David E.; and Beckman, Robert F., 4,500,065, Cl. 248-542.000.
Cipher Data Products, Inc.: *See—*
Gray, Martin D., 4,500,965, Cl. 364-400.000.
Cipolla, Arthur F.: *See—*
Gomersall, Earl R.; and Cipolla, Arthur F., 4,500,880, Cl. 340-825.350.
Claas Ohg: *See—*
Hollmann, Bernd, 4,499,714, Cl. 56-341.000.
Clading-Boel, John P., to Waite & Son Limited. Aqueous ink writing tip. 4,500,222, Cl. 401-209.000.
Clarion Co., Ltd.: *See—*
Tomizawa, Akimori; and Osaka, Hiroshi, 4,500,921, Cl. 358-174.000.
Clark, Amos M.: *See—*
Billingsley, Henry C.; and Clark, Amos M., 4,499,887, Cl. 123-575.000.
Clark, Brian K.: *See—*
Paulson, Bernard S.; Paulson, Bruce H.; Clark, Brian K.; and Briesemeister, Richard A., 4,499,992, Cl. 198-498.000.

Clark Equipment Company: *See—*
Trusock, George J.; Bauer, James J.; and Gandhi, Bhupen, 4,500,819, Cl. 318-106.000.
Clark, James M.; Secrist, Duane R.; Hardin, Scotty L.; and McEntyre, Stephen C., to Great Lakes Carbon Corporation. Anode retraction device for a Hall-Heroult cell equipped with inert anodes. 4,500,401, Cl. 204-225.000.
Clark, K. Warren: *See—*
Puglia, Wayne J.; Kehoe, Gary S.; and Clark, K. Warren, 4,500,547, Cl. 426-3.000.
Clelford, Douglas H.: *See—*
Murphy, Richard D.; Perez, Ricardo L.; and Clelford, Douglas H., 4,500,967, Cl. 364-434.000.
Clevinger, Martin R. Dual signal magnetic pickup with even response of strings of different diameters. 4,499,809, Cl. 84-1.150.
Cline, Harvey E., to General Electric Company. Thin film binary metallic eutectics. 4,500,609, Cl. 428-610.000.
Cline, Harvey E., to General Electric Company. Semiconductor devices utilizing eutectic masks. 4,500,898, Cl. 357-23.000.
Cline, Richard L.: *See—*
Rabito, Thomas G.; Oswalt, Stephen M.; and Cline, Richard L., 4,500,606, Cl. 428-480.000.
Clouston, John L. System for immobilizing a plywood press platen during a press cycle. 4,499,821, Cl. 100-51.000.
Clouth Gummiwerke Aktiengesellschaft: *See—*
Braitsch, Hans; Ortwein, Hermann; and Vorwald, Josef, 4,500,037, Cl. 238-2.000.
Cloutier, Frank L.: *See—*
Buck, Roy T.; Cloutier, Frank L.; Erni, R. Ernst; Low, Robert N.; and Terry, F. Duncan, 4,500,895, Cl. 346-140.00R.
Coats Wheel Balancer Corp.: *See—*
Madden, Allan C.; Cellucci, Robert; Hoshida, Robert A.; and MacKay, Duncan, 4,499,768, Cl. 73-462.000.
Coburn, James A. Identification band. 4,499,680, Cl. 40-304.000.
Coca-Cola Company, The: *See—*
Kramer, Thomas, 4,500,248, Cl. 414-459.000.
Cochran, Stanley R.; and Strahorn, Francis W., to Du Pont de Nemours, E. I., and Company. Yarn heat treatment apparatus. 4,500,278, Cl. 425-445.000.
Coden, Michael H.: *See—*
Scholl, Frederick W.; and Coden, Michael H., 4,500,165, Cl. 350-96.200.
Codenoll Technology Corporation: *See—*
Scholl, Frederick W.; and Coden, Michael H., 4,500,165, Cl. 350-96.200.
Codman & Shurtleff, Inc.: *See—*
Mickiewicz, Stanley, 4,500,832, Cl. 323-340.000.
Coduti, Phillip L.: *See—*
Kim, Yong-Wu; Coduti, Phillip L.; Sok, Brian A.; and Carter, William A., 4,500,561, Cl. 427-25.000.
Coherent, Inc.: *See—*
Sasnett, Michael W.; Hobart, James L.; and Gibson, Larry A., 4,500,996, Cl. 372-19.000.
Colder Products Company: *See—*
Blenkush, Brian J., 4,500,118, Cl. 285-247.000.
Cole, Ernest R., Jr.; Lee, Agnes Y.; and Paulson, Danton L., to United States of America, Interior. Production of lead from sulfides. 4,500,398, Cl. 204-117.000.
Cole, Eugene O.; and Yeterian, Vahan H., to United States of America, Air Force. Optical system for measuring shadowgraph data. 4,500,206, Cl. 356-376.000.
Cole Polymers Limited: *See—*
Pearson, Leonard L.; and Litchfield, John, 4,500,568, Cl. 427-294.000.
Cole, Rodger E.; and Vander Meer, Richard H., to Goldco Engineering, Inc. Method and apparatus for forming cylindrical articles into a single line. 4,500,229, Cl. 406-88.000.
Coleman, John E.: *See—*
Kaczur, Jerry J.; and Coleman, John E., 4,500,499, Cl. 423-139.000.
Collins, Gordon T., to Allied Corporation. Electrical connector assembly having an anti-decoupling device. 4,500,154, Cl. 339-89.00M.
Colores Hispania, S.A.: *See—*
Sole, Carlos M.; and Vallvey, Juan A., 4,500,361, Cl. 106-298.000.
Combi Co., Ltd.: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 4,500,133, Cl. 297-131.000.
Combustion Electromagnetics, Inc.: *See—*
Ward, Michael A. V.; and Lefevre, Robert P., 4,499,872, Cl. 123-344.000.
Combustion Engineering, Inc.: *See—*
Loomis, Robert W.; and Lawton, Carl W., 4,499,860, Cl. 122-510.000.
Commander Electrical Equipment, Inc.: *See—*
Sepulveda, Luis F., 4,500,863, Cl. 337-70.000.
Commissariat a l'Energie Atomique: *See—*
Courtois, Guy; and Jaquen, Claude, 4,500,227, Cl. 405-128.000.
Communications Satellite Corporation: *See—*
Childs, William H., 4,500,856, Cl. 332-9.00R.
Virupaksha, Krishnamoorthy; and Suyderhoud, Henri G., 4,500,842, Cl. 328-150.000.
Virupaksha, Krishnamoorthy; and Campanella, Samuel J., 4,501,001, Cl. 375-30.000.
Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme): *See—*
Eltgen, Jean J., 4,500,293, Cl. 434-114.000.
Compagnie Neerlandaise de l'Azote (Societe Anonyme): *See—*
Van Hijfte, Willy H. P.; and Vanmarcke, Luc A., 4,500,336, Cl. 71-29.000.
Conard, Wendell R.: *See—*
Hayes, Robert A.; and Conard, Wendell R., 4,500,466, Cl. 260-429.900.
Congoleum Corporation: *See—*
Ehrenfeld, Frank E., Jr., 4,500,319, Cl. 8-114.500.
Conlon, Daniel J.: *See—*
Sundberg, Jack G.; Schaffner, John P.; and Conlon, Daniel J., 4,500,268, Cl. 418-1.000.
Conner, Bruce E. Electrochromic imaging apparatus. 4,500,174, Cl. 350-357.000.
Conoco Inc.: *See—*
Lovercheck, Dale R.; and Curran, George P., 4,499,864, Cl. 123-3.000.
Container Graphics Corporation: *See—*
Simpson, Jack R., 4,499,802, Cl. 83-117.000.
Conway, Gregory J., to United States of America, Army. Acoustic emission monitoring. 4,499,769, Cl. 73-587.000.
Cook, David L., to PDL Industries Limited. Weatherproof and/or dust proof fitting. 4,500,008, Cl. 220-242.000.
Cook, Frank T.; Nutt, Michael O.; and Hsieh, Hsin H., to Dow Chemical Company, The. Process for preparation of 2-oxazolidinones. 4,500,717, Cl. 548-229.000.
Cook, John E.: *See—*
Hanson, John D.; and Cook, John E., 4,499,916, Cl. 137-103.000.
Cooper, Larry: *See—*
Lieu, Dennis K.; and Cooper, Larry, 4,499,736, Cl. 62-3.000.
Copeland, James R., to Whitehall Corporation. Seismic streamer connector assembly. 4,500,980, Cl. 367-154.000.
Copelin, Harry B., to Du Pont de Nemours, E. I., and Company. Method for reducing oligomeric cyclic ether content of a polymerizate. 4,500,705, Cl. 528-417.000.
Copyer Kabushiki Kaisha: *See—*
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,500,619, Cl. 430-59.000.
Corea, William C.: *See—*
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,499,955, Cl. 175-46.000.
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,499,956, Cl. 175-46.000.
Cormed, Inc.: *See—*
Jess, Thurman S., 4,500,269, Cl. 418-45.000.
Cornell Research Foundation, Inc.: *See—*
Nathanielsz, 4,500,523, Cl. 514-178.000.
Cornick, Keith: *See—*
Ko, Yu M.; and Cornick, Keith, 4,500,834, Cl. 324-52.000.
Corning Glass Works: *See—*
Brown, Patrick C., 4,500,043, Cl. 242-45.000.
Crossman, Tommy L., 4,500,549, Cl. 426-33.000.
Thompson, David A., 4,500,722, Cl. 549-429.000.
Weetall, Howard H., 4,500,554, Cl. 426-323.000.
Corti, Costante: *See—*
Caporiccio, Gerardo; Viola, Gian T.; and Corti, Costante, 4,500,739, Cl. 568-677.000.
Cotter, Byron R.; and Tang, David Y., to Occidental Chemical Corporation. Preparation of trifluoromethyl-benzoyl halides. 4,500,471, Cl. 260-544.00D.
Cottle, Wilbur W., Jr.; and Smith, Lilburn R., to Texas Instruments Incorporated. Gyro stabilized optics with fixed detector. 4,500,051, Cl. 244-3.160.
Couch, Robert P.: *See—*
Bullis, Robert H.; and Couch, Robert P., 4,499,755, Cl. 73-116.000.
Councell, Graham D. Fuel burning assembly. 4,499,858, Cl. 122-14.000.
Courtois, Guy; and Jaquen, Claude, to Commissariat a l'Energie Atomique. Process and geological installation for the removal of radioactive waste. 4,500,227, Cl. 405-128.000.
Coxon, John R. Device for clamping workpieces. 4,500,077, Cl. 269-45.000.
Coyle, Peter J., to RCA Corporation. Protective cartridge for disc record. 4,499,996, Cl. 206-444.000.
Crampton, Arthur W.; Gray, Hollis L., Jr.; and Mermelstein, Seymour, to Dresser Industries, Inc. Variable capacitance pressure transducer. 4,499,773, Cl. 73-718.000.
Crawford, James J.: *See—*
McCallister, Ronald D.; and Crawford, James J., 4,500,994, Cl. 371-43.000.
Creative Technology Corp.: *See—*
Tuten, William J.; and Crosby, Kennith D., 4,499,984, Cl. 194-4.00C.
Credali, Lino; Martini, Emilio; and Lori, Domenico, to Montedison S.p.A. Process for preparing multilayer fibrous structures and product. 4,500,594, Cl. 428-284.000.
Crepin, Herve , to Huret et ses Fils. Derailler for a cycle having an orientable chain guiding device. 4,500,302, Cl. 474-82.000.
Crescent Hosiery Mills: *See—*
Burn, William H., 4,499,742, Cl. 66-172.00E.
Critikon, Inc.: *See—*
Chang, Joseph J.; and Ramsey, Maynard, III, 4,499,901, Cl. 128-635.000.
Cromwell, Clarence A.: *See—*
Austin, James W.; Bradburn, Ronald G.; Cromwell, Clarence A.; Gratch, Eitan; Groiss, Erich; Perkins, Derek; and Walker, Robert A., 4,500,496, Cl. 423-55.000.

Crosby, Kennith D.: *See*—
Tuten, William J.; and Crosby, Kennith D., 4,499,984, Cl. 194-4.00C.

Crossman, Tommy L., to Corning Glass Works. Use of whey-derived products as cheese flavoring agents or enhancers. 4,500,549, Cl. 426-33.000.

Crowe, Norman P.: *See*—
Madewell, James A.; Molitor, Edwin A.; Crowe, Norman P.; Lampe, Guy W.; and Pavey, Charles F., 4,500,245, Cl. 414-108.000.

Crown Controls Corporation: *See*—
Luebrecht, Donald; and Klopfleisch, Kim A., 4,499,971, Cl. 187-9.00R.

Crown Cork & Seal Company, Inc.: *See*—
Urban, Joseph, 4,499,931, Cl. 141-67.000.

Crown Zellerbach Corporation: *See*—
Reba, Imants; Schutz, Rudolph W.; and Kozbur, Nestor, 4,499,801, Cl. 83-24.000.

Crozet, Francois E. G.: *See*—
Kervistin, Robert; Lardellier, Alain M. J.; Mazeaud, Georges; and Crozet, Francois E. G., 4,500,143, Cl. 384-467.000.

Crump, Druce K.; Simon, Jaime; and Wilson, David A., to Dow Chemical Company, The. Methylenephosphonic acid derivatives of bis-(aminoalkyl)piperazines as cement set retarding agents. 4,500,356, Cl. 106-90.000.

Crump, Druce K.: *See*—
Simon, Jaime; Crump, Druce K.; and Wilson, David A., 4,500,469, Cl. 260-502.50E.

Crutcher Resources Corporation: *See*—
Goekler, Robert G., 4,500,570, Cl. 427-345.000.

Csaszar, Gabor; Oehley, Gernot F.; and Goldman, Fred M. Carburetion system. 4,500,475, Cl. 261-36.00A.

Cubin, Anatoly A.: *See*—
Zsoka, Istvan; Madar, Laszlo ; Cubin, Anatoly A.; Gaivoronsky, Albert A.; Farukshin, Lev H.; Morzsic, Piotr A.; Lisov, Aleksandr I.; and Galusztainc, Vladilen A., 4,499,947, Cl. 166-179.000.

Culver, Richard B.; and Oliver, Donald W., to Dresser Industries, Inc. Method and apparatus for determining neutron characteristics of borehole fluids. 4,500,781, Cl. 250-269.000.

Cummins, Donald L., to AMF Incorporated. Linear peristaltic pump. 4,500,266, Cl. 417-474.000.

Cummins Engine Company, Inc.: *See*—
Sermersheim, DeWayne T.; and Baxter, Jack L., 4,500,303, Cl. 474-112.000.

Cunningham, Seamus: *See*—
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,500,428, Cl. 210-609.000.

Curley, John J., Jr. Carrier for portable audio devices. 4,500,019, Cl. 224-222.000.

Curran, George P.: *See*—
Lovercheck, Dale R.; and Curran, George P., 4,499,864, Cl. 123-3.000.

Cvengros, Jan: *See*—
Tkac, Alexander; and Cvengros, Jan, 4,500,390, Cl. 159-6.100.

Cyriax, Wilhelm; Tamboers, Gerhard; and Holzschuh, Johannes, to Battenfeld Maschinenfabriken GmbH. Quick-change mold assembly for injection-molding machines. 4,500,274, Cl. 425-185.000.

D. W. Zimmerman Mfg., Inc.: *See*—
Fox, Albert D.; Kish, Robert J.; and Knight, Donn C., 4,500,074, Cl. 254-270.000.

Daemmer, Johnathan E., to Boulais, Richard A., a part interest. Robot vehicle guidance system including checkpoint realignment system. 4,500,970, Cl. 364-513.000.

Daewoo Electronic Co.: *See*—
Lee, Kyung-Suk, 4,500,752, Cl. 179-2.0EA.

D'Agostino, Vincent F.; Lee, Joseph Y.; Zapisek, Stephen; and Schore, George. Copper recovery process. 4,500,396, Cl. 204-107.000.

Dahod, Ashraf M. Digital communication system. 4,500,989, Cl. 370-85.000.

DAI-E Systems, Inc.: *See*—
Huang, Timothy D., 4,500,872, Cl. 340-365.00R.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Kubota, Hajime, 4,500,373, Cl. 156-79.000.
Takeuchi, Hideo; Kaneko, Toshihisa; and Ikeda, Satoshi, 4,499,827, Cl. 101-425.000.

Daicel Chemical Industries, Ltd.: *See*—
Ishii, Kiyoshi; Murai, Masataka; and Yonekawa, Hitoshi, 4,500,426, Cl. 210-321.300.

Daikin Kogyo Co., Ltd.: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,500,694, Cl. 526-245.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Yamada, Mitsuhiko, 4,500,917, Cl. 358-75.000.

D'Alfonso, Nunzio: *See*—
Neitz, Alfred; D'Alfonso, Nunzio; and Pickel, Hans, 4,499,871, Cl. 123-276.000.

Damico, Joyce A., to Kimberly-Clark Corporation. Disposable garment. 4,500,316, Cl. 604-389.000.

Dan, Takashi: *See*—
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.

Dana Corporation: *See*—
Kaminski, David C.; and Shea, Dennis W., 4,499,980, Cl. 192-35.000.

Daniels, Frank J. Palletizing process and a product of that process. 4,500,001, Cl. 206-597.000.

Daniels, Raymond A., to International Business Machines Corporation. Multiple roller magnetic brush developer having development electrode voltage switching. 4,500,198, Cl. 355-14.00D.

Danielsen, Brant R.: *See*—
Kulin, Ralph; Granzow, Daniel B.; and Danielsen, Brant R., 4,500,788, Cl. 250-455.100.

Dannatt, Hugh St. L., to Pitney Bowes Inc. Transport means for flat bed scanner. 4,500,197, Cl. 355-8.000.

Darland, Michael L.; Stoner, Donald L.; Baker, James W., Jr.; and Sponhnholtz, Michael A., to Microperipheral Corporation. Data communication system. 4,500,751, Cl. 179-2.0DP.

Dasgupta, Purnendu K. Continuously rejuvenated ion exchanger. 4,500,430, Cl. 210-638.000.

Daugherty, Estes M. Drill steel idler guide. 4,500,141, Cl. 308-4.00R.

David, Stan A.; and Woodhouse, John J., to United States of America, Energy. Assembly for testing weldability of sheet metal. 4,499,758, Cl. 73-159.000.

Davidson, Eric H.: *See*—
Britten, Roy J.; and Davidson, Eric H., 4,500,786, Cl. 250-389.000.

Davis, Lester M., deceased; and Davis, Ruth L., executor. Fishing lure. 4,499,682, Cl. 43-42.190.

Davis, Murray A. Production of breathing materials. 4,499,611, Cl. 2-169.000.

Davis, Randall C. Course correction calculator. 4,499,665, Cl. 33-1.0SB.

Davis, Ruth L., executor: *See*—
Davis, Lester M., deceased; and Davis, Ruth L., executor, 4,499,682, Cl. 43-42.190.

Davis, Sammy G.; and Gulling, Donna C. Method of fabricating dentures. 4,500,291, Cl. 433-213.000.

Dawson, Jeffery C.: *See*—
Engelhardt. Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,500,437, Cl. 252-8.55C.

Dayco Corporation: *See*—
Foster, Randy C., 4,500,304, Cl. 474-138.000.

De Dietrich & Cie: *See*—
Guffroy, Gerard, 4,500,560, Cl. 427-8.000.

Dean, Raymond H.: *See*—
Reese, James A.; and Dean, Raymond H., 4,500,034, Cl. 236-49.000.

Dean, Robert A.: *See*—
Ford, James M.; Dean, Robert A.; Woodard, Kenneth E., Jr.; and Branco, Antonio, 4,500,379, Cl. 156-172.000.

Dean, Robert G.: *See*—
Bodge, Kevin R.; and Dean, Robert G., 4,499,762, Cl. 73-170.00A.

Debernardis, John F.; and Arendsen, David L., to Abbott Laboratories. Substituted 1-aminomethyl-phthalans. 4,500,543, Cl. 514-469.000.

de Campos, Hugo N., to Bendix Corporation, The. Bearing member. 4,500,144, Cl. 384-463.000.

Deconinck, Filip N.: *See*—
Rosseel, Henri J.; and Deconinck, Filip N., 4,501,008, Cl. 377-2.000.

Deere & Company: *See*—
Jacobi, Stephen F.; Haight, Robert E.; Schletzbaum, John W.; Martin, Yolanda E.; and Lang, Stephen P., 4,500,874, Cl. 340-607.000.
Sandvik, Leonard E., 4,500,062, Cl. 248-371.000.

deFasselle, Craig R.; and deFasselle, Robert J. Fluid flow switch. 4,500,759, Cl. 200-81.90R.

deFasselle, Robert J.: *See*—
deFasselle, Craig R.; and deFasselle, Robert J., 4,500,759, Cl. 200-81.90R.

DeFay, Christian: *See*—
Gimel, Bernard; and DeFay, Christian, 4,500,891, Cl. 346-76.0PH.

De Ferrari, Alfred; and Doddman, William H., to Avco Corporation. Powder feed system with recirculator for plasma spray apparatus. 4,500,038, Cl. 239-85.000.

Deforeit, Christian J., to Matth. Hohner AG. Method of and apparatus for producing an orchestra effect. 4,500,317, Cl. 84-1.240.

De Groot, Hubert, to N.V. Raychem S.A. Heat-recoverable article. 4,500,371, Cl. 156-48.000.

Dehn, Dieter, to Stellram GmbH. Rotary material removing tool. 4,500,233, Cl. 408-182.000.

Dejmek, Eberhard: *See*—
Girodi, Erich; Bornowski, Gunter; Dejmek, Eberhard; Knabe, Andreas; Koch, Roland; Urbach, Bernd; and Weisselberg, Arnold, 4,500,764, Cl. 219-59.100.

Dekura, Hitoshi: *See*—
Futaki, Kenji; and Dekura, Hitoshi, 4,500,971, Cl. 364-513.500.

Delalande S.A.: *See*—
Platel, Alain Y.; Lacour, Alain P.; and Bourgery, Guy R., 4,500,531, Cl. 514-255.000.

DeLigt, John, to Westvaco Corporation. Method of using a veneer butt-end splicer. 4,500,376, Cl. 156-159.000.

Della-Moretta, Leonard B. Aircraft towing and carrying linkage systems having high stability. 4,500,056, Cl. 244-137.00R.

De Lorenzi, John J.; and Sumka, Elmer H., to Westinghouse Electric Corp. Transportation system. 4,499,973, Cl. 187-29.000.

DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, to Wisconsin Alumni Research Foundation. 23,23-Difluoro-25-hydroxy-vitamin D_3 and process for preparing same. 4,500,460, Cl. 260-397.200.

Demonte, Flippo; and Figini, Mario, to Ing. C. Olivetti & C., S.p.A. Electronic typewriter. 4,500,216, Cl. 400-8.000.
Demoute, Jean-Pierre: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,500,720, Cl. 549-313.000.
Demuth, Dietmar, to Thomson-CSF. Receiver device for a multi-element ultrasonic probe echograph and echograph equipped in this way. 4,499,902, Cl. 128-660.000.
Denise, Bernard; Hamon, Christian; Senes, Michel; and Sneeden, Raymond, to Societe Chimique de la Grande Paroisse, Azote et Producits Chimiques. Conversion catalysts for synthesis gas. 4,500,646, Cl. 502-78.000.
Desai, Rohit: *See*—
Loev, Bernard; Shroff, James R.; and Desai, Rohit, 4,500,527, Cl. 514-223.000.
DeSipio, Richard G.: *See*—
Beyer, Henry R.; DeSipio, Richard G.; Long, Thomas F.; and Ritz, Joseph, 4,500,885, Cl. 343-456.000.
Naubereit, Henry; Beyer, Henry R.; DeSipio, Richard G.; and Picard, Salvatore R., 4,500,884, Cl. 343-456.000.
Desjobert, Gilles; and Jaillet, Andre , to Rhone-Poulenc-Textile. Method and apparatus for baling a tow of textile filaments. 4,499,707, Cl. 53-429.000.
DeSoto, Inc.: *See*—
Devona, James E.; and Essigmann, Martin L., 4,500,673, Cl. 524-548.000.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Baumer, Klaus; and Wiegand, Herbert, 4,499,862, Cl. 123-1.00A.
Wiegand, Herbert; and Baumer, Klaus, 4,499,861, Cl. 123-1.00A.
Devellian, Richard D.; and Swenson, Paul M., to Kona Corporation. Heat pipe manifold system. 4,500,279, Cl. 425-548.000.
Development Finance Corporation of New Zealand: *See*—
Buckle, Ian G.; and Built, Steven M., 4,499,694, Cl. 52-167.000.
Devona, James E.; and Essigmann, Martin L., to DeSoto, Inc. Vinylidene chloride and styrene-containing copolymer latices. 4,500,673, Cl. 524-548.000.
Devro, Inc.: *See*—
Hanlon, Allan J., 4,500,574, Cl. 428-35.000.
DeYoung, David H.: *See*—
Weyand, John D.; Woods, Robert W.; DeYoung, David H.; and Ray, Siba P., 4,500,406, Cl. 204-293.000.
Diamond Shamrock Chemicals Company: *See*—
Solomon, Frank, 4,500,647, Cl. 502-101.000.
DiBello, Benedict J.: *See*—
Moran, Thomas M.; and DiBello, Benedict J., 4,500,240, Cl. 411-103.000.
Dicks, Jack L.: *See*—
Shimbo, Osamu; Nguyen, Lan N.; and Dicks, Jack L., 4,500,984, Cl. 370-6.000.
Diederich, Dennis A.; Wiegmann, Thomas B.; and Pinnick, Robert V., to Kansas University Endowment Association, The. Method for regional anticoagulation during extracorporeal dialysis. 4,500,309, Cl. 604-5.000.
Diercksmeier, Richard A.: *See*—
Kilb, Donald A.; and Diercksmeier, Richard A., 4,499,690, Cl. 51-56.00R.
Diery, Helmut; and Mees, Bernhard, to Hoechst Aktiengesellschaft. Quaternary crosslinked products of xylylene dichlorides and triethanolamine condensates and their use. 4,500,735, Cl. 564-286.000.
Dietrich, Jerry L.: *See*—
Rozmus, Walter J.; and Dietrich, Jerry L., 4,500,009, Cl. 220-256.000.
Diggle, Dennis A. Geotechnical cone lubrication apparatus and method. 4,499,954, Cl. 175-21.000.
DiGiovanni, John; and Golden, Donald M., to Ethicon, Inc. Multiple clip applier. 4,500,024, Cl. 227-19.000.
Digital Equipment Corporation: *See*—
Manton, John C.; and Okin, Kenneth, 4,500,958, Cl. 364-200.000.
Dimitrov, Milko D., to N P S P "Novotex". Method of and apparatus for producing twistless yarns from glued separate fibers fitted together. 4,499,717, Cl. 57-297.000.
Dinius, Harold B.: *See*—
McKnight, Hugh P.; Welty, Kenneth B.; and Dinius, Harold B., 4,500,247, Cl. 414-416.000.
Discovision Associates: *See*—
Gregg, David P., 4,500,484, Cl. 264-107.000.
Slaten, Gary G., 4,500,392, Cl. 204-5.000.
Disteldorf, Josef; and Gras, Rainer, to Chemische Werke Huls Aktiengesellschaft. Mixture of substances suitable for use as a powder varnish or binder for powder varnishes. 4,500,697, Cl. 528-45.000.
Disteldorf, Josef; and Gras, Rainer, to Chemische Werke Huls Aktiengesellschaft. One-component baking enamels. 4,500,698, Cl. 528-45.000.
Dittrich, Volker, to Ciba-Geigy Corporation. Pesticidal composition containing a synergistic combination of an oxazolo-pyridine thiophosphate derivative and cypermethrin. 4,500,521, Cl. 514-81.000.
Divall, John E.: *See*—
Perigo, John A.; and Divall, John E., 4,499,932, Cl. 141-91.000.
Dixon, Ronald H. T.: *See*—
Else, George E.; Millward, Cyril; Dixon, Ronald H. T.; and Jorgensen, Knut, 4,500,352, Cl. 75-130.00B.
Dlugosz, Henry J.: *See*—
Tuttle, Alan H.; Leonard, James K.; and Dlugosz, Henry J., 4,500,096, Cl. 277-53.000.
Dobner, Eberhard: *See*—
Ehrich, Gerd; and Dobner, Eberhard, 4,499,960, Cl. 177-25.000.
Dr. -Ing. Rudolf Hell GmbH: *See*—
Beisswenger, Siegfried, 4,500,791, Cl. 250-493.100.
Kuhn, Franz; Lippek, Wilfried; Mollgaard, Klaus; and Redecker, Friedrich, 4,500,972, Cl. 364-526.000.
Dodd, Alec G.; and Hamblett, Martin, to Rolls-Royce Limited. Cooled turbine blade for a gas turbine engine. 4,500,258, Cl. 416-97.00R.
Doddman, William H.: *See*—
De Ferrari, Alfred; and Doddman, William H., 4,500,038, Cl. 239-85.000.
Dola, Frank P., to AMP Incorporated. Network interface device. 4,500,158, Cl. 339-122.00R.
Domtar Inc.: *See*—
Bialkowski, Wojciech L., 4,500,968, Cl. 364-471.000.
Donaldson Company, Inc.: *See*—
Gillingham, Gary R., 4,500,332, Cl. 55-443.000.
Donn Incorporated: *See*—
LaLonde, Paul D., 4,499,697, Cl. 52-98.000.
Donnelly, John H. Cosmetic and observer line of sight mirror. 4,500,169, Cl. 350-288.000.
Dorina Nahmaschinen GmbH: *See*—
Meier, Gunter; Meier, Willi; and Hartwig, Jurgen, 4,499,836, Cl. 112-158.00E.
Dorn, John J.: *See*—
Farr, Richard S.; and Dorn, John J., 4,499,733, Cl. 60-611.000.
Dornier GmbH: *See*—
Krojer, Hubert, 4,500,055, Cl. 244-55.000.
Doughman, Charles L.: *See*—
Shuey, Kenneth C.; and Doughman, Charles L., 4,500,837, Cl. 324-102.000.
Douglas, Jack E., to Arthur Shaw Manufacturing Limited. Fastener for sliding doors or windows. 4,500,122, Cl. 292-161.000.
Dow Chemical Company, The: *See*—
Cook, Frank T.; Nutt, Michael O.; and Hsieh, Hsin H., 4,500,717, Cl. 548-229.000.
Crump, Druce K.; Simon, Jaime; and Wilson, David A., 4,500,356, Cl. 106-90.000.
Erickson, Robert E., 4,500,585, Cl. 428-152.000.
Fazio, Michael J.; and Paisley, Kirk E., 4,500,728, Cl. 560-222.000.
Fisk, Thomas E., 4,500,675, Cl. 524-762.000.
Hay, Robert A., II; and Krause, Brian W., 4,499,749, Cl. 72-325.000.
Kruper, William J., Jr.; and Swart, Daniel J., 4,500,704, Cl. 528-405.000.
LaTulip, Randy J., 4,500,690, Cl. 525-502.000.
McKinley, Mark J.; and Sheridan, Dan P., 4,500,670, Cl. 524-445.000.
McKinney, Osborne K.; and Flores, David P., 4,500,664, Cl. 524-119.000.
Meyer, Louis W., 4,500,442, Cl. 252-182.000.
Paalman, H. Hunter; and Drapeau, Denis, 4,500,500, Cl. 423-224.000.
Simon, Jaime; Crump, Druce K.; and Wilson, David A., 4,500,469, Cl. 260-502.50E.
Skach, Edward J., Jr., 4,500,349, Cl. 75-0.50B.
Wilson, David A., 4,500,470, Cl. 260-502.50E.
Wolfe, David L., 4,500,687, Cl. 525-412.000.
Dow Corning Corporation: *See*—
Kroupa, Loretta A.; and Relyea, Elton H., 4,500,659, Cl. 523-213.000.
Dowbenko, Rostyslaw: *See*—
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; and O'Dwyer, James B., 4,500,680, Cl. 525-143.000.
Downing, Gerald T.; and Schaefer, Karl P., to W. H. Brady Co. Carrier for hinged support of pages. 4,500,223, Cl. 402-20.000.
Drapeau, Denis: *See*—
Paalman, H. Hunter; and Drapeau, Denis, 4,500,500, Cl. 423-224.000.
Dresser Industries, Inc.: *See*—
Crampton, Arthur W.; Gray, Hollis L., Jr.; and Mermelstein, Seymour, 4,499,773, Cl. 73-718.000.
Culver, Richard B.; and Oliver, Donald W., 4,500,781, Cl. 250-269.000.
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,500,437, Cl. 252-8.55C.
Winkelbauer, Howard M.; Hill, Kenneth W.; and Wang, Ke-Chin, 4,500,644, Cl. 501-98.000.
Drexler, Jerome, to Drexler Technology Corporation. High data capacity, scratch and dust resistant, infrared, read-write data card for automatic teller machines. 4,500,777, Cl. 235-487.000.
Drexler Technology Corporation: *See*—
Drexler, Jerome, 4,500,777, Cl. 235-487.000.
Driam Metallprodukt GmbH & Co. KG: *See*—
Dunaitschik, Rudolf, 4,499,847, Cl. 118-19.000.
DrM, Dr. Muller AG: *See*—
Muller, Hans, 4,500,435, Cl. 210-798.000.
Drogi, Dieter: *See*—
Lange, Heinz; Rix, Albert; and Drogi, Dieter, 4,500,219, Cl. 400-568.000.
Droll, Frances. Wall hanging. 4,499,688, Cl. 47-83.000.
Du Pont Canada Inc.: *See*—
Hajto, Ernest A., 4,500,370, Cl. 149-109.600.
DuBois, R. Clark, to Gradco Systems, Inc. Drop tray sorter. 4,500,087, Cl. 271-293.000.

Dubreuil, Luc; and Reed, Phillip J., to Northern Telecom Limited. Gas pressurizable cable with compressed plug seal and method of making it. 4,500,747, Cl. 174-76.000.

DuBroff, Richard E., to Phillips Petroleum Company. Seismic exploration. 4,500,976, Cl. 367-48.000.

Duff-Norton Co.: *See—*
Barber, Ralph R.; and Schultze, Eckart F., 4,500,069, Cl. 251-282.000.

Duffy, John J.: *See—*
Gitlin, Harvey S.; and Duffy, John J., 4,499,983, Cl. 194-1.00G.

DuFour, Daniel L., to Monsanto Company. Polyblends of thermoplastic copolyetheresters styrene-maleic anhydride polymers, and acrylonitrile-butadiene-styrene polymers. 4,500,679, Cl. 525-64.000.

Duhamel, Georges: *See—*
Malbec, Yves; Boisot, Yves; Bontemps, Daniel; and Duhamel, Georges, 4,500,760, Cl. 200-83.00C.

Duke, Alan H.; Hartung, Michael H.; Marschner, Frederick J.; and Nolan, Kenneth P., to International Business Machines Corporation. Cache bypass system with post-block transfer directory examinations for updating cache and/or maintaining bypass. 4,500,954, Cl. 364-200.000.

Dulin, Kerry, to Textron, Inc. Fastener driving device having a three stage firing circuit. 4,500,936, Cl. 361-152.000.

Dulin, Kerry, to Textron, Inc. Fastener driving device. 4,500,938, Cl. 361-153.000.

Dunaitschik, Rudolf, to Driam Metallprodukt GmbH & Co. KG. Apparatus for coating granules such as dragee pellets with a hardenable substance. 4,499,847, Cl. 118-19.000.

Duncan, William A.: *See—*
Morr, Gary F.; and Duncan, William A., 4,500,997, Cl. 372-58.000.

Du Pont de Nemours, E. I., and Company: *See—*
Antal, Paul S.; and Katz, Manfred, 4,499,716, Cl. 57-234.000.
Cochran, Stanley R.; and Strahorn, Francis W., 4,500,278, Cl. 425-445.000.
Copelin, Harry B., 4,500,705, Cl. 528-417.000.
Freerksen, Robert W., 4,500,344, Cl. 71-93.000.
Haber, Stephen B., 4,500,520, Cl. 514-63.000.
Irwin, Robert S.; and Logullo, Francis M., Sr., 4,500,699, Cl. 528-128.000.

Durbin-Durgo, Inc.: *See—*
Smith, Lonnie M., 4,500,073, Cl. 254-258.000.

Durmis, Julius; Balogh, Alojz; Karvas, Milan; Hrachovcova, Maria; Masek, Jan; Caucik, Pavol; and Povazancova, Marta, to Chemicke zavody Juraja Dimitrova, narodny podnik. Mixed unsaturated monocarboxylic acid esters of 2,2,6,6-tetramethyl-4-piperidinol and of its ammonium carboxylate as stabilizer against UV in polymeric materials. 4,500,446, Cl. 252-403.000.

Durr Automation + Fordertechnik GmbH: *See—*
Obenland, Gerhard, 4,499,788, Cl. 74-661.000.

Duvall, William E.; and Hwang, Mau-Choung P., to RCA Corporation. Television receiver standby power supply. 4,500,923, Cl. 358-190.000.

Duwelz, Alain J., to Societe Nationale Industrielle Aerospatiale. Mechanism for docking and joining space craft. 4,500,057, Cl. 244-161.000.

Dyett, Derek H.; Wood, Godfrey A.; and Seim, Albert D., II, to Molins, Ltd. Cutting head for a cigarette filter attachment machine. 4,499,910, Cl. 131-95.000.

DynaGel Incorporated: *See—*
Shank, Joseph L., 4,500,453, Cl. 260-117.000.

E.C.H. Will (GmbH & Co.): *See—*
Peters, Hartmut; and Ramcke, Bernd, 4,500,241, Cl. 412-37.000.

E. D. Coddington Manufacturing Company: *See—*
Kilb, Donald A.; and Diercksmeier, Richard A., 4,499,690, Cl. 51-56.00R.

E. J. Brooks Company: *See—*
Swift, Allan W., 4,500,124, Cl. 292-318.000.

E. R. Squibb & Sons, Inc.: *See—*
Gordon, Eric M.; and Godfrey, Jollie D., Jr., 4,500,518, Cl. 514-2.000.
Sprague, Peter W.; and Heikes, James E., 4,500,723, Cl. 549-459.000.

Eaton Corporation: *See—*
Janutka, William J., 4,500,801, Cl. 307-570.000.
Janutka, William J., 4,500,802, Cl. 307-571.000.
Klein, Gary S., 4,500,748, Cl. 174-121.00A.
Mezak, John A., 4,500,858, Cl. 333-202.000.
Moran, Thomas M.; and DiBello, Benedict J., 4,500,240, Cl. 411-103.000.
Peloza, Kirk B., 4,499,915, Cl. 137-85.000.
Zukausky, Keith E., 4,500,067, Cl. 251-38.000.

Ebara Corporation: *See—*
Kuramoto, Kenji, 4,500,793, Cl. 250-574.000.

Ebauches, S.A.: *See—*
Grimm, Maurice, 4,500,213, Cl. 368-208.000.

Ebenhoch, Sebastian: *See—*
Orth, Eugene C.; and Ebenhoch, Sebastian, 4,500,234, Cl. 408-206.000.

Eckert, Alton B.: *See—*
Buan, Danilo P.; and Eckert, Alton B., 4,500,780, Cl. 250-231.0SE.

Edging, Thomas E., to Stauffer Chemical Company. Leavening acid composition. 4,500,557, Cl. 426-563.000.

Edwards, Laroy H., to Chevron Research Company. Insecticidal 5-thiocarbamoyl-1,3,4-oxadiazoles. 4,500,539, Cl. 514-364.000.

Egami, Tsuneyuki: *See—*
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Nogami, Susumu; and Suzuki, Yukio, 4,499,882, Cl. 123-492.000.

Ehni, George J., to Texas Instruments Incorporated. Programmable attenuator. 4,500,845, Cl. 330-86.000.

Ehrenfeld, Frank E., Jr., to Congoleum Corporation. Textured pile fabrics. 4,500,319, Cl. 8-114.500.

Ehrich, Gerd; and Dobner, Eberhard, to Mannesmann Aktiengesellschaft. Method for measuring the weight of bulk goods loaded by a hydraulic excavator. 4,499,960, Cl. 177-25.000.

Eisai Co., Ltd.: *See—*
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Inai, Yuichi; Kohara, Yoshiyuki; Kawakami, Yoshiyuki; and Tsurugi, Tomio, 4,500,463, Cl. 260-406.000.

Eisenlohr, Karl-Heniz: *See—*
Simo, Thomas; Eisenlohr, Karl-Heniz; and Puxbaumer, Hans-Hermann, 4,500,415, Cl. 208-56.000.

Eisenzimmer, George W.: *See—*
Schisler, Robert C.; and Eisenzimmer, George W., 4,500,095, Cl. 277-34.000.

Elander, Robert C.; Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Shuck, Robert E.; and Tuchman, Walter L., to International Business Machines Corporation. Cryptographic application for interbank verification. 4,500,750, Cl. 178-22.080.

Elbe, Hans-Ludwig; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combating fungi with triazolyl-vinyl ketones and carbinols. 4,500,537, Cl. 514-383.000.

Elder, Richard B.: *See—*
Bosselaers, Robert J.; and Elder, Richard B., 4,500,857, Cl. 332-9.00R.

Electric Power Development Company Limited: *See—*
Nakaoji, Kazuhiko; Kamao, Mitsugu; Itoh, Hayami; Tatsumi, Shuhei; and Takao, Shoichi, 4,500,041, Cl. 241-16.000.

Electronic Specialists: *See—*
Stifter, Francis J., 4,500,853, Cl. 331-18.000.

Elevator GmbH: *See—*
Makinen, Heimo; and Suur-Askola, Seppo, 4,499,972, Cl. 187-29.00R.

Eli Lilly and Company: *See—*
Bach, Nicholas J.; Kornfeld, Edmund C.; and Titus, Robert D., 4,500,545, Cl. 514-619.000.
Burow, Kenneth W., Jr., 4,500,343, Cl. 71-76.000.
Matsumoto, Ken, 4,500,533, Cl. 514-256.000.
McKnight, Hugh P.; Welty, Kenneth B.; and Dinius, Harold B., 4,500,247, Cl. 414-416.000.
Spitzer, Wayne A.; and Goodson, Theodore, Jr., 4,500,456, Cl. 260-239.00A.

Ellenberger, Charles E.; Bower, George L.; and Snow, William R., to Pacific Western Systems, Inc. Independently variably controlled pulsed R.F. plasma chemical vapor processing. 4,500,563, Cl. 427-38.000.

Elring Dichtungswerke GmbH: *See—*
Bindel, Rudolf; and Ruoff, Eugen, 4,500,100, Cl. 277-235.00B.

Else, George E.; Millward, Cyril; Dixon, Ronald H. T.; and Jorgensen, Knut, to Stanton and Staveley Limited; and A/S Bjolvefossen. Production of cast iron. 4,500,352, Cl. 75-130.00B.

Eltac Nogler & Daum KG: *See—*
Oppitz, Hans, 4,500,410, Cl. 204-299.00R.

Eltgen, Jean J., to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme). Apparatus for converting electric signals representing data into a group of raised dots constituting the image of said data. 4,500,293, Cl. 434-114.000.

Elwing, Ben; Foldi, Peter; and Holmberg, Gote, to Broderna Holmbergs Fabriks AB. Machine for crushing cylindrical aluminium cans for beer, soft drinks etc. 4,499,824, Cl. 100-48.000.

Embury Company: *See—*
Embury, Lloyd, 4,500,387, Cl. 156-499.000.

Embury, Lloyd, to Embury Company. Laminating apparatus wherein sheets to be bonded form heating chamber. 4,500,387, Cl. 156-499.000.

Emerson, Clarence A. Marker holder apparatus. 4,500,221, Cl. 401-82.000.

Emerson Electric Co.: *See—*
Peachee, C. Theodore, Jr., 4,499,661, Cl. 29-598.000.
Quin, Murray L., deceased, 4,500,796, Cl. 307-147.000.

Encomech Engineering Services Limited: *See—*
Laws, William R.; and Reed, Geoffrey R., 4,499,746, Cl. 72-13.000.

Endo, Shigeru: *See—*
Tanaka, Kenji; and Endo, Shigeru, 4,500,551, Cl. 426-62.000.

Endo, Takashi, to Canon Kabushiki Kaisha. Shutter arrangement. 4,500,187, Cl. 354-266.000.

Enertec: *See—*
Ley, Anthony J., 4,500,973, Cl. 364-606.000.

Engelhard Corporation: *See—*
Amundsen, Alan R.; and Stern, Eric W., 4,500,465, Cl. 260-429.00R.

Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., to Cassella Aktiengesellschaft; and Dresser Industries, Inc. Water soluble copolymers for use in fracture-acidizing of wells. 4,500,437, Cl. 252-8.55C.

Engineering Research Applications, Inc.: *See—*
Rooney, Craig E., 4,500,757, Cl. 200-5.00A.

Engles, Bruce E., to Motorola, Inc. Page mode memory system. 4,500,961, Cl. 364-200.000.

English, Brian B.; and Gray, Hamish W. M., to Ferranti plc. Control system for positioning a marker on a cathode-ray tube display. 4,500,876, Cl. 340-709.000.

Enomoto, Yuji, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for surface treatment by ion bombardment. 4,500,564, Cl. 427-39.000.
Environmental Equipment Corporation: *See*—
Hussey, Ian G., 4,499,970, Cl. 187-9.00R.
Eotec Corporation: *See*—
Krohn, David A.; Buffone, Louis A.; and Vinarub, Edmond I., 4,500,870, Cl. 340-347.00P.
Epic International Corporation: *See*—
Lewis, William D., 4,500,294, Cl. 433-215.000.
Epson Corporation: *See*—
Akazawa, Hiroyuki, 4,500,023, Cl. 226-76.000.
Hirano, Seiichi, 4,500,892, Cl. 346-76.0PH.
Erickson, Robert E., to Dow Chemical Company, The. Creped absorbent composites. 4,500,585, Cl. 428-152.000.
Ernest, Ivan: *See*—
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,500,457, Cl. 260-245.20R.
Erni, R. Ernst: *See*—
Buck, Roy T.; Cloutier, Frank L.; Erni, R. Ernst; Low, Robert N.; and Terry, F. Duncan, 4,500,895, Cl. 346-140.00R.
Erwin Sick GmbH Optik-Elektronik: *See*—
Sick, Erwin, 4,500,208, Cl. 356-431.000.
Eschenko, Vladislav Y.; Musaev, Irsali K.; Talibdzhanov, Zakhidzhan S.; Leonov, Viktor A.; Bobrov, Anatoly D.; Kirovsky, Efim I.; Gritsenko, Vladimir A.; and Golovanov, Alexandr V. Burner guide vane device. 4,500,282, Cl. 431-184.000.
Esco Design, Inc.: *See*—
Swanson, Richard G., 4,500,805, Cl. 310-80.000.
Escolar, Carlos: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
Espinosa, Fausto L.; and Nunez, Cesar L. Variable speed electric induction motors without bushes. 4,500,826, Cl. 318-820.000.
Essigmann, Martin L.: *See*—
Devona, James E.; and Essigmann, Martin L., 4,500,673, Cl. 524-548.000.
Ethicon, Inc.: *See*—
DiGiovanni, John; and Golden, Donald M., 4,500,024, Cl. 227-19.000.
Eue, Ludwig: *See*—
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert R., 4,500,341, Cl. 71-92.000.
Evans, David B.: *See*—
Hunt, Arlon J.; Hansen, Leif J.; and Evans, David B., 4,499,893, Cl. 126-449.000.
Evans, Jack; and Studer, Philip A., to United States of America, National Aeronautics and Space Administration. Magnetically actuated compressor. 4,500,265, Cl. 417-417.000.
Evans Radak, Suzanne: *See*—
Chorvat, Robert J.; Lenz, George R.; and Evans Radak, Suzanne, 4,500,708, Cl. 544-34.000.
Evapco, Inc.: *See*—
Bradley, Wilson E., Jr.; and Rye, Palle, 4,500,330, Cl. 55-257.0PV.
Everson, Charles W.: *See*—
Bender, Fredric G.; Everson, Charles W.; and Swartz, William E., 4,500,559, Cl. 426-646.000.
Evey, William M.: *See*—
Kub, Francis J.; and Evey, William M., 4,499,653, Cl. 29-571.000.
EVG Entwicklungs- u. Verwertungs-Gesellschaft m.b.H.: *See*—
Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, 4,500,763, Cl. 219-58.000.
Ewers, Frederick H. Power driven disc cultivator apparatus. 4,499,747, Cl. 172-68.000.
Ewing, Peter D., to NSS, Industries, Inc. Coupling for sucker rod assembly. 4,500,224, Cl. 403-343.000.
Ex-Cell-O Corporation: *See*—
Bacon, Forrest C.; and Nord, Keith W., 4,499,704, Cl. 53-156.000.
Exxon Research & Engineering Co.: *See*—
Krutenat, Richard C., 4,500,364, Cl. 148-6.14R.
Malpass, Dennis B., 4,500,648, Cl. 502-115.000.
Scheller, Andor, 4,499,706, Cl. 53-399.000.
Shulman, Cindy B., 4,500,681, Cl. 525-222.000.
Fa.Jungheinrich Unternehmensverwaltung KG: *See*—
Helms, Dirk, 4,499,790, Cl. 74-665.00C.
Fabian, Walter; and Spooner, Frank H., to Sperry Corporation. Deep mesa process for fabricating monolithic integrated Schottky barrier diode for millimeter wave mixers. 4,499,656, Cl. 29-576.00E.
Facoetti, Hugues: *See*—
Broussoux, Dominique; Facoetti, Hugues; Ravinet, Pierre; Bernard, Daniel; and Micheron, Francois, 4,500,377, Cl. 156-164.000.
Faessler, Rene , to Societe Alsacienne de Construction de Materiel Textile. Freed-fiber spinning devices. 4,499,719, Cl. 57-417.000.
Farmitalia Carlo Erba S.p.A.: *See*—
Bernardi, Luigi; Temperilli, Aldemio; Ruggieri, Daniela; Arcari, Giuliana; and Salvati, Patricia, 4,500,712, Cl. 546-67.000.
Farr Company: *See*—
Farr, Richard S.; and Dorn, John J., 4,499,733, Cl. 60-611.000.
Farr, Richard S.; and Dorn, John J., to Farr Company. Emergency shutdown mechanism for a turbocharged diesel engine. 4,499,733, Cl. 60-611.000.
Farukshin, Lev H.: *See*—
Zsoka, Istvan; Madar, Laszlo ; Cubin, Anatoly A.; Gaivoronsky Albert A.; Farukshin, Lev H.; Morzsic, Piotr A.; Lisov, Alek sandr I.; and Galusztainc, Vladilen A., 4,499,947, Cl. 166-179.000
Fassauer, Arthur L. Apparatus for storing and serving perishable foo products. 4,500,145, Cl. 312-61.000.
Fathauer, George H.; and Hood, Charles F., to Berwind Corporation. Capacitance-type material level indicator. 4,499,766, Cl. 73-304.00C.
Fathauer, George H.; Hood, Charles F.; and Runck, Robin B., to Berwind Corporation. Capacitance-type material level indicator. 4,499,767, Cl. 73-304.00C.
Fatula, James J., Sr.; and Carroll, Martin J., to Ryman Engineering Company. Method of grinding non-uniform workpieces. 4,499,693, Cl. 51-322.000.
Fawwaz, Rashid A.: *See*—
Srivastava, Suresh C.; Fawwaz, Rashid A.; and Richards, Powell, 4,500,508, Cl. 424-1.100.
Fazio, Michael J.; and Paisley, Kirk E., to Dow Chemical Company, The. Process for preparing 2-aminoethyl methacrylate salts of high purity. 4,500,728, Cl. 560-222.000.
Feagans, Frederick C.; and Nordquist, Albert W., to Pratt-Read Corporation. Keyboard switch having a deformable membrane formed of cellular urethane. 4,500,756, Cl. 200-5.00A.
Feinberg, Jack, to University of Southern California. Phase conjugation using internal reflection. 4,500,855, Cl. 332-7.510.
Fenn, Lloyd B., to Texas A&M University. Composition of matter and method of use for nitrogen fertilization. 4,500,335, Cl. 71-28.000.
Ferdinand Menrad, Firma: *See*—
Schonhut, Kurt, 4,500,179, Cl. 351-137.000.
Ferranti plc: *See*—
English, Brian B.; and Gray, Hamish W. M., 4,500,876, Cl. 340-709.000.
Maiden, Adrian J., 4,500,207, Cl. 356-409.000.
Ferrero, Giuseppe, to Fiat Auto S.p.A. Device for stopping and holding in the open position a sliding door on a vehicle. 4,500,121, Cl. 292-79.000.
Ferro, Berkeley M.; and Walker, Aubrey D., to Post Office, The. Identification matter. 4,500,116, Cl. 283-92.000.
Ferro Corporation: *See*—
Wilson, James M., 4,500,942, Cl. 361-320.000.
Ferron, Ernest J. Obturator for flute designed to improve the emission of certain notes. 4,499,810, Cl. 84-384.000.
Fiat Auto S.p.A.: *See*—
Ferrero, Giuseppe, 4,500,121, Cl. 292-79.000.
Figini, Mario: *See*—
Demonte, Flippo; and Figini, Mario, 4,500,216, Cl. 400-8.000.
Fillpro Products, Inc.: *See*—
Johnson, Dwight N., 4,499,616, Cl. 4-393.000.
Fiorina, Mark A.; and Roberts, Todd N., to Badger Meter, Inc. Modular metering apparatus. 4,499,764, Cl. 73-253.000.
Firestone Tire & Rubber Company, The: *See*—
Hayes, Robert A.; and Conard, Wendell R., 4,500,466, Cl. 260-429.900.
Fischer, Rudolf; and Spiegel, Nikolaus, to Heidelberger Druckmaschinen AG. Device and process for high-precision measurement of the phase relationship and phase displacement, respectively, of two pulse trains. 4,499,760, Cl. 73-159.000.
Fishback, Alton J., to Mead Corporation, The. Apparatus for imparting angular movement to articles while being moved along a predetermined path. 4,499,990, Cl. 198-411.000.
Fisk, Thomas E., to Dow Chemical Company, The. Stable dispersions of polymers in polyfunctional compounds having a plurality of active hydrogens. 4,500,675, Cl. 524-762.000.
Fister, Julius C.; and Breedis, John F., to Olin Corporation. Electrical component forming process. 4,500,605, Cl. 428-469.000.
Fister, Julius C.: *See*—
Breedis, John F.; and Fister, Julius C., 4,500,028, Cl. 228-117.000.
Fladerer, Heinrich, to Siemens Aktiengesellschaft. Synchronizing arrangement. 4,500,992, Cl. 370-100.000.
Flanigen, Edith: *See*—
Lok, Brent M. T.; Marcus, Bonita K.; and Flanigen, Edith, 4,500,651, Cl. 502-208.000.
Flautt, Martin C.: *See*—
Wong, Robert; Flautt, Martin C.; and Haines, Richard M., 4,500,600, Cl. 428-391.000.
Flaxington, David: *See*—
Szczupak, David T.; Walsham, Brian E.; Hooley, Desmond J.; Flaxington, David; McKean, Peter S.; and Wescott, John D., 4,499,732, Cl. 60-602.000.
Fleckenstein, Phillip P., to Berwind Corporation. Method of manufacturing capacitance-type material level indicator probe. 4,499,641, Cl. 29-25.410.
Fleming, Dennis J., to Prince Corporation. Visor control. 4,500,131, Cl. 296-97.00K.
Flock, John W.: *See*—
Ward, William J., III; Ritzer, Alan; Carroll, Kenneth M.; and Flock, John W., 4,500,724, Cl. 556-472.000.
Flores, David P.: *See*—
McKinney, Osborne K.; and Flores, David P., 4,500,664, Cl. 524-119.000.
FMC Corporation: *See*—
Lill, Melvin H., 4,500,201, Cl. 356-152.000.
Liston, Allen L., 4,499,963, Cl. 180-90.600.
Foldi, Peter: *See*—
Elwing, Ben; Foldi, Peter; and Holmberg, Gote, 4,499,824, Cl. 100-48.000.

Fontana, Jack J.; and Reams, Walter, to United States of America, Energy. High temperature polymer concrete compositions. 4,500,674, Cl. 524-650.000.
Forcht, Brennan A.: *See*—
Patten, James W.; Moss, Ronald W.; and Forcht, Brennan A., 4,500,602, Cl. 428-408.000.
Ford Aerospace & Communications Corporation: *See*—
Montesanto, Ernest C., 4,500,170, Cl. 350-611.000.
Ford, James M.; Dean, Robert A.; Woodard, Kenneth E., Jr.; and Branco, Antonio, to Olin Corporation. Method of making a composite fiber reinforced plastic frame. 4,500,379, Cl. 156-172.000.
Ford Motor Company: *See*—
Allor, Richard L.; and Caverly, John C., 4,499,646, Cl. 29-447.000.
Gandhi, Haren S.; and Watkins, William L. H., 4,499,863, Cl. 123-3.000.
Garrett, William G.; and Overberg, Karl W., 4,499,673, Cl. 361-56.000.
Mikola, James A., 4,500,946, Cl. 362-226.000.
Foreman, Frederick J.: *See*—
Bloome, James A.; Meeker, Rick A.; Whicker, Jerry T.; and Foreman, Frederick J., 4,499,624, Cl. 15-97.00R.
Forester, Buford G. Valve. 4,499,919, Cl. 137-613.000.
Forms & Surfaces: *See*—
Grossman, Harvey L., 4,499,629, Cl. 16-111.00R.
Forrester, Jerry. Tamper-evident cap assembly for a container. 4,500,005, Cl. 215-203.000.
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Phenoxycarboxylic acid amide compounds and herbicidal compositions. 4,500,341, Cl. 71-92.000.
Foster, Randy C., to Dayco Corporation. Belt tensioner. 4,500,304, Cl. 474-138.000.
Foster, William J., to Transilwrap Company, Inc. Method of manufacture of resin film precision biomedical article. 4,500,382, Cl. 156-272.800.
Fox, Adrian S., to Austenal International, Inc. Radiopaque acrylic resin. 4,500,658, Cl. 523-117.000.
Fox, Albert D.; Kish, Robert J.; and Knight, Donn C., to D. W. Zimmerman Mfg., Inc. Fluid-operated apparatus for handling and lifting loads. 4,500,074, Cl. 254-270.000.
Framo Developments (UK) Limited: *See*—
Mohn, Frank, 4,500,263, Cl. 417-360.000.
Francis, Geoffrey V. Structural spacer glazing with connecting spacer device. 4,500,572, Cl. 428-34.000.
Frankel, Milton B.; and Wilson, Edgar R., to Rockwell International Corporation. Tris(2-azidoethyl)amine and method of preparation thereof. 4,499,723, Cl. 60-211.000.
Freeauf, Robert F. Dwelling structure. 4,499,696, Cl. 52-79.800.
Freerksen, Robert W., to Du Pont de Nemours, E. I., and Company. Herbicidal ortho-(alkoxy)-benzenesulfonamides. 4,500,344, Cl. 71-93.000.
Frehel, Daniel; Maffrand, Jean-Pierre; and Vallee, Eric, to Sanofi, S.A. Thieno-pyridinone derivatives, process for its preparation, and anti-blood-platelet and anti-thrombotic applications thereof. 4,500,534, Cl. 514-301.000.
Freis, Jean-Louis: *See*—
Oger, Jacques; Hauer, Jean-Claude; and Freis, Jean-Louis, 4,499,695, Cl. 52-19.000.
French, Eddie; and Braga, Thomas G., to Petrolite Corporation. Corrosion inhibited aqueous slurries. 4,500,445, Cl. 252-387.000.
Frenette, Albert: *See*—
Frenette, Eugene J., 4,499,913, Cl. 126-247.000.
Frenette, Eugene J., to Frenette, Albert. Method and apparatus for producing friction heat. 4,499,913, Cl. 126-247.000.
Freundlich, Richard A., to Celanese Corporation. Electrical grade extruded filled thermoplastic sheet material and process for the manufacture thereof. 4,500,603, Cl. 428-409.000.
Friberg, Gunnar S., to AB Volvo. Cable jacket. 4,499,926, Cl. 138-126.000.
Friedman, Abraham, to IPCO Corporation. Method and apparatus for reinforcing dental anchors. 4,500,296, Cl. 433-225.000.
Friedmann & Maier Aktiengesellschaft: *See*—
Lehner, Gerhard, 4,499,873, Cl. 123-372.000.
Frohberger, Paul-Ernst: *See*—
Elbe, Hans-Ludwig; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,500,537, Cl. 514-383.000.
Fruchey, Olan S., to Celanese Corporation. Copper and manganese recovery from C_5-C_9 saturated aliphatic monocarboxylic acids 4,500,464, Cl. 260-413.000.
Fruzzetti, Paul R.; Leavitt, Philip J.; and Nuzzi, Frank J., to Varian Associates, Inc. Counterflow leak detector with cold trap. 4,499,752, Cl. 73-40.700.
Frydman, Allen: *See*—
Reimann, Hans; Frydman, Allen; and Fuchs, Uwe, 4,500,429, Cl. 210-616.000.
Fuchikami, Jun; Higashi, Hidehiro; Inoue, Takashi; and Oba, Hiroyuki, to Catalysts & Chemicals Industries Co., Ltd. Hydrocracking catalyst composition and method of making same. 4,500,645, Cl. 502-65.000.
Fuchs, Uwe: *See*—
Reimann, Hans; Frydman, Allen; and Fuchs, Uwe, 4,500,429, Cl. 210-616.000.
Fuji Electric Company Limited: *See*—
Takezoe, Fumihiko; and Fujii, Junichi, 4,500,953, Cl. 364-200.000.
Fuji Facom Corporation: *See*—
Takezoe, Fumihiko; and Fujii, Junichi, 4,500,953, Cl. 364-200.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Sugiura, Katsuhiko, 4,499,874, Cl. 123-407.000.
Fuji Photo Film Co., Ltd.: *See*—
Aoki, Kozo; Ogawa, Akira; and Tanabe, Osami, 4,500,635, Cl. 430-552.000.
Aono, Toshiaki; Hara, Hiroshi; and Naito, Hideki, 4,500,624, Cl. 430-138.000.
Horie, Seiji; Nakano, Junji; Nagata, Masayoshi; and Sato, Hideo, 4,500,622, Cl. 430-78.000.
Kato, Hisatoyo, 4,500,783, Cl. 250-327.200.
Kita, Nobuyuki; Matsumoto, Hiroshi; and Hagiwara, Hitoshi, 4,500,625, Cl. 430-149.000.
Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; Sato, Kozo; and Fujita, Shinsaku, 4,500,626, Cl. 430-203.000.
Naito, Hideki; and Yabuki, Yoshiharu, 4,500,627, Cl. 430-203.000.
Nakayama, Takao, 4,500,617, Cl. 430-49.000.
Ogawa, Hiroshi; Mizuno, Chiaki; Masaki, Kouichi; Suzuki, Masaaki; and Tamai, Yasuo, 4,500,599, Cl. 428-336.000.
Ohishi, Chikashi, 4,500,620, Cl. 430-60.000.
Ohmura, Kunioki; Torigoe, Masaaki; Itoh, Isamu; and Hayashi, Katsumi, 4,500,632, Cl. 430-428.000.
Oishi, Kengo; and Suzuki, Osamu, 4,500,050, Cl. 242-198.000.
Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; and Karino, Yukio, 4,500,636, Cl. 430-566.000.
Sakanoue, Kei; Yagihara, Morio; Ichijima, Seigi; and Nagao, Kimitoshi, 4,500,634, Cl. 430-544.000.
Sano, Kenji; Kondo, Syunichi; and Sato, Hideo, 4,500,623, Cl. 430-83.000.
Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, 4,500,630, Cl. 430-386.000.
Shiba, Keisuke; Yazawa, Hiromi; Ohishi, Chikashi; and Nakao, Sho, 4,500,618, Cl. 430-49.000.
Takahashi, Osamu; Yamamura, Nobuo; Mukunoki, Yasuo; Ogawa, Shungi; and Nakagawa, Yutaka, 4,500,362, Cl. 106-309.000.
Wada, Minoru; Takahashi, Yonosuke; and Hasegawa, Eiichi, 4,500,889, Cl. 346-1.100.
Fuji Xerox Co., Ltd.: *See*—
Ozawa, Takashi, 4,500,927, Cl. 358-293.000.
Fujii, Akio: *See*—
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,500,452, Cl. 260-112.50R.
Fujii, Junichi: *See*—
Takezoe, Fumihiko; and Fujii, Junichi, 4,500,953, Cl. 364-200.000.
Fujii, Kouhei: *See*—
Ishitobi, Yoshimitsu; Fujii, Kouhei; and Nakatsuji, Fumio, 4,500,867, Cl. 338-128.000.
Fujii, Masahiko: *See*—
Katayama, Hiroomi; Hirosawa, Yoshiaki; and Fujii, Masahiko, 4,499,875, Cl. 123-416.000.
Fujii, Masao; and Nishiyama, Enju, to Mitsubishi Denki Kabushiki Kaisha. Temperature control device for a fuel cell. 4,500,612, Cl. 429-26.000.
Fujimori, Noboru: *See*—
Sakamoto, Eiichi; Kawasaki, Mikio; Ono, Kouji; Fukuoji, Kakujulo; and Fujimori, Noboru, 4,500,631, Cl. 430-413.000.
Fujino, Masahisa: *See*—
Sunouchi, Akio; Suzuki, Ryuji; Fujino, Masahisa; and Konno, Tatsuo, 4,500,186, Cl. 354-234.000.
Fujisawa, Masao: *See*—
Mizusawa, Mitutoyo; and Fujisawa, Masao, 4,500,138, Cl. 303-6.00C.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, 4,500,709, Cl. 544-58.100.
Fujita, Shinsaku: *See*—
Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; Sato, Kozo; and Fujita, Shinsaku, 4,500,626, Cl. 430-203.000.
Fujita, Yuji: *See*—
Yuhara, Akitsuna; Hosaka, Norio; Fujita, Yuji; Kishimoto, Kiyoharu; and Yamada, Jun, 4,500,807, Cl. 310-313.00B.
Fujitsu Limited: *See*—
Ban, Yasutaka; and Osada, Toshihiko, 4,500,789, Cl. 250-492.200.
Mori, Haruhisa, 4,500,365, Cl. 148-1.500.
Ohno, Kenichi; Hosomizu, Tohru; and Ogawa, Rokutaro, 4,500,906, Cl. 357-71.000.
Shirai, Kazunari; and Tanaka, Izumi, 4,500,899, Cl. 357-23.000.
Shirato, Takehide, 4,500,975, Cl. 365-104.000.
Fujiwara, Toshitaka: *See*—
Tokitsu, Naoki; Fujiwara, Toshitaka; Kato, Toranosuke; and Uno, Toshihiko, 4,500,868, Cl. 340-52.00F.
Fujiya, Toshimichi. Ventilator for coldroom with pressure responsive valves. 4,499,917, Cl. 137-341.000.
Fukami, Akira; Noguchi, Hiroki; and Hamaguchi, Hiroshi, to Nippon Soken, Inc. Humidifier. 4,500,479, Cl. 261-98.000.
Fukoku Kogyo Company Limited: *See*—
Sato, Hachiro, 4,499,822, Cl. 100-117.000.
Fukuda, Masao, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing apparatus with check weigher. 4,499,961, Cl. 177-25.000.
Fukuhara, Toru: *See*—
Kusaka, Yosuke; and Fukuhara, Toru, 4,500,778, Cl. 250-204.000.
Fukumura, Yukio: *See*—
Matsukura, Masayuki; and Fukumura, Yukio, 4,501,019, Cl. 455-112.000.
Fukuoji, Kakujulo: *See*—
Sakamoto, Eiichi; Kawasaki, Mikio; Ono, Kouji; Fukuoji, Kakujulo; and Fujimori, Noboru, 4,500,631, Cl. 430-413.000.

Fukuoka, Takeyo: *See*—
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tukuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,500,452, Cl. 260-112.50R.
Fulger, Charles V.; and Bradbury, Allan G., to General Foods Corporation. Modification of bran by extrusion. 4,500,558, Cl. 426-622.000.
Funfstuck, Horst. Rotatable closure and dispensing device for collapsible tubes and/or containers. 4,500,016, Cl. 222-153.000.
Furst, Emanuel F.; Lampe, Louis F.; and Woods, William L., to University of Arizona Foundation. Methods and apparatus for testing a blood pressure monitoring system of the hydraulic type. 4,499,903, Cl. 128-675.000.
Furstenwerth, Hauke, to Bayer Aktiengesellschaft. 2,5-Diamino-1,3,4-thiadiazole derivatives. 4,500,715, Cl. 548-140.000.
Furukawa, Nobuyuki; and Sanbe, Mitsuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Supporting apparatus for carburetor controlling cam plate. 4,500,478, Cl. 261-52.000.
Furutachi, Nobuo: *See*—
Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, 4,500,630, Cl. 430-386.000.
Furutsu, Akira, to Japan Bano'k Co. Ltd.; and Ben Clements & Sons, Inc. Cable banding machine. 4,499,928, Cl. 140-93.200.
Furuya, Akira: *See*—
Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, 4,500,640, Cl. 435-253.000.
Fussner, Paul: *See*—
Backe, Egbert; Muller, Rolf; Otto, Dieter; Leonardi, Cornelio; Kochendorfer, Heinrich; Fussner, Paul; Walker, Ewald; and Rommel, Rudi, 4,499,757, Cl. 73-119.00A.
Futaba Denshi Kogyo K.K.: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,500,741, Cl. 136-206.000.
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,500,742, Cl. 136-206.000.
Futagi, Masaaki: *See*—
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Futagi, Masaaki, 4,499,979, Cl. 192-3.310.
Futaki, Kenji; and Dekura, Hitoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic copying machine. 4,500,971, Cl. 364-513.500.
Fuzishiro, Tuneo: *See*—
Shima, Toshiaki; Hamamuro, Naozi; Ikari, Shinichi; and Fuzishiro, Tuneo, 4,499,929, Cl. 141-1.100.
G. D. Serle & Co.: *See*—
Chorvat, Robert J.; Lenz, George R.; and Evans Radak, Suzanne, 4,500,708, Cl. 544-34.000.
G.D Societa' per Azioni: *See*—
Seragnoli, Enzo, 4,499,909, Cl. 131-84.00R.
GA Technologies Inc.: *See*—
Kapich, Davorin D., 4,500,093, Cl. 277-15.000.
Gagnon, Peter R.: *See*—
Blaisdell, Ronald G.; and Gagnon, Peter R., 4,500,948, Cl. 362-382.000.
Gagnon, Ralph J.; and Cedarstrom, Roy A., to Hughes Aircraft Company. Two color liquid crystal light valve image projection system with single prepolarizer. 4,500,172, Cl. 350-331.00R.
Gaiser, Robert F., to Bendix Corporation, The. Fast-fill master cylinder. 4,499,729, Cl. 60-578.000.
Gaivoronsky, Albert A.: *See*—
Zsoka, Istvan; Madar, Laszlo ; Cubin, Anatoly A.; Gaivoronsky, Albert A.; Farukshin, Lev H.; Morzsic, Piotr A.; Lisov, Aleksandr I.; and Galusztainc, Vladilen A., 4,499,947, Cl. 166-179.000.
Gala Industries, Inc.: *See*—
Smith, Donald W., 4,500,271, Cl. 425-67.000.
Galasso, Francis S.: *See*—
Veltri, Richard D.; Galasso, Francis S.; and Mendelson, Mel I., 4,500,483, Cl. 264-81.000.
Galbraith, Andrew D., to Lockheed Missiles & Space Company, Inc. Electrochemical cell and method. 4,500,613, Cl. 429-69.000.
Galkiewicz, John. Kitty tease. 4,499,855, Cl. 119-29.000.
Gallucci, Jacques: *See*—
Gauthier-Lafaye, Jean; Perron, Robert; Gallucci, Jacques; and Leconte, Philippe, 4,500,473, Cl. 260-548.000.
Gallup, Darrell L.: *See*—
Jost, John W.; and Gallup, Darrell L., 4,500,434, Cl. 210-696.000.
Galusztainc, Vladilen A.: *See*—
Zsoka, Istvan; Madar, Laszlo ; Cubin, Anatoly A.; Gaivoronsky, Albert A.; Farukshin, Lev H.; Morzsic, Piotr A.; Lisov, Aleksandr I.; and Galusztainc, Vladilen A., 4,499,947, Cl. 166-179.000.
Galwey, Ronald K.; and Kanazawa, Kay K., to International Business Machines Corporation. High speed, power potentiostat/galvanostat with IR compensation for use with an electrochemical cell. 4,500,840, Cl. 324-425.000.
Gandhi, Bhupen: *See*—
Trusock, George J.; Bauer, James J.; and Gandhi, Bhupen, 4,500,819, Cl. 318-106.000.
Gandhi, Haren S.; and Watkins, William L. H., to Ford Motor Company. Method of operating an internal combustion engine on a methanol fuel. 4,499,863, Cl. 123-3.000.
Garavuso, Gerald M., to Xerox Corporation. Rotating inverter. 4,500,086, Cl. 271-225.000.
Garcia, Fred: *See*—
Campoli, Alan A.; and Garcia, Fred, 4,500,329, Cl. 55-189.000.
Gareis, Ronald E.: *See*—
Konrad, Charles E.; Gareis, Ronald E.; and Lodhia, Amratlal C., 4,500,818, Cl. 318-52.000.
Garganese, Ugo S.; Griffin, John R.; and Martin, Raymond H. Denture occlusal mounting translator. 4,500,289, Cl. 433-54.000.
Garnant, Craig M.: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
Garner, Derek H., to USM Corporation. Gripper assembly. 4,499,622, Cl. 12-14.500.
Garrett, William G.; and Overberg, Karl W., to Ford Motor Company. Reverse voltage clamp circuit. 4,499,673, Cl. 361-56.000.
Garrett, William R., to Smith International, Inc. Method of making a drill pipe wear sleeve assembly and product thereof. 4,499,924, Cl. 138-110.000.
Garton, Stanley C.: *See*—
Hoyt, Robert M.; Bobbitt, Donald E.; Bartee, Gary E.; Garton, Stanley C.; and Pilliard, J. Paul, 4,499,698, Cl. 52-157.000.
Gasparini, Aldo; and Wimnell, Nils-Erik. Arrangement for slat screens for solar protection. 4,499,892, Cl. 126-446.000.
Gasser, Markus, to SIG Schweizerische Industrie-Gesellschaft. Method and apparatus for deflecting articles during their conveyance. 4,499,988, Cl. 198-369.000.
Gasser, Rene , to Maschinenfabrik AD. Schulthess & Co. AG. Method for washing laundry in a pass-through washing machine. 4,499,621, Cl. 8-158.000.
Gauthier-Lafaye, Jean; Perron, Robert; Gallucci, Jacques; and Leconte, Philippe, to Rhone-Poulenc Chimie de Base. Preparation of carboxylic acid anhydrides. 4,500,473, Cl. 260-548.000.
Gauthier-Lafaye, Jean; and Perron, Robert, to Rhone-Poulenc Chimie de Base. Carbonylation of methyl acetate. 4,500,474, Cl. 260-549.000.
Gaylord, Norman G.: *See*—
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,500,337, Cl. 71-67.000.
Young, Robert W.; Prussin, Samuel, deceased; and Gaylord, Norman G., 4,500,338, Cl. 71-67.000.
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,500,339, Cl. 71-67.000.
Geberth, John D., Jr. Fluid swivel coupling. 4,500,119, Cl. 285-276.000.
Gelhard, Egon. Method and apparatus for measuring a distance using ultrasonic echo signals, particularly for use on a motor vehicle. 4,500,977, Cl. 367-108.000.
General Clutch Corp.: *See*—
Waine, Martin; Rude, Edward T.; and Nisenson, Jules, 4,499,937, Cl. 160-41.000.
General Dynamics Corporation/Convair Div.: *See*—
Morghen, Manfred, 4,500,079, Cl. 269-47.000.
General Electric Company: *See*—
Anthony, Thomas R., 4,499,655, Cl. 29-576.00J.
Bitting, Ricky F.; and Peil, William, 4,500,821, Cl. 318-254.000.
Bloomer, Milton D., 4,500,838, Cl. 324-117.00R.
Cline, Harvey E., 4,500,609, Cl. 428-610.000.
Cline, Harvey E., 4,500,898, Cl. 357-23.000.
Hauck, Robert B.; and Susami, Larry, 4,501,011, Cl. 378-196.000.
Karas, Bradley R.; and Baumgartner, Charles E., 4,500,566, Cl. 427-115.000.
Karazim, Michael P.; Okashima, Bob Y.; and Ashburn, John J., 4,499,691, Cl. 51-241.00S.
Kinsinger, Richard E., 4,500,934, Cl. 361-3.000.
Konrad, Charles E.; Gareis, Ronald E.; and Lodhia, Amratlal C., 4,500,818, Cl. 318-52.000.
Lenz, Henry G., 4,499,660, Cl. 29-598.000.
McMillan, John E., 4,500,811, Cl. 315-58.000.
Medeiros, Charles W.; and Wagner, James B., 4,499,756, Cl. 73-118.000.
Miller, Timothy J. E., 4,500,824, Cl. 318-701.000.
Modic, Frank J., 4,500,584, Cl. 428-145.000.
Nester, William H., 4,500,887, Cl. 343-700.0MS.
Stahl, Gunther R., 4,499,800, Cl. 82-36.00R.
Taylor, Dale F.; and Sammler, Louis S., 4,500,413, Cl. 204-435.000.
Vermilyea, Mark E., 4,500,860, Cl. 335-216.000.
Ward, William J., III; Ritzer, Alan; Carroll, Kenneth M.; and Flock, John W., 4,500,724, Cl. 556-472.000.
Yerman, Alexander J., 4,500,029, Cl. 228-123.000.
General Electric Company, p.l.c., The: *See*—
Ko, Yu M.; and Cornick, Keith, 4,500,834, Cl. 324-52.000.
General Foods Corporation: *See*—
Fulger, Charles V.; and Bradbury, Allan G., 4,500,558, Cl. 426-622.000.
Langston, Metty S. K., 4,500,556, Cl. 426-540.000.
Liggett, Louis G.; Lang, Kevin W.; Wyss, Clement R.; and Williams, Richard A., 4,500,553, Cl. 426-101.000.
General Motors Corporation: *See*—
Stoltman, Donald D.; and Nichols, Gary A., 4,499,879, Cl. 123-480.000.
Tincher, Jon D., 4,500,769, Cl. 219-86.330.
General Signal Corporation: *See*—
Weiss, Edward L., 4,501,021, Cl. 455-601.000.
GEO Vann, Inc.: *See*—
Vann, Roy R., 4,499,951, Cl. 166-297.000.
George, Douglas A.: *See*—
Leibowitz, Marshall; and George, Douglas A., 4,500,173, Cl. 350-345.000.
Gerber, Christoph E.: *See*—
Binnig, Gerd K.; and Gerber, Christoph E., 4,499,737, Cl. 62-56.000.

Gerber, Heinz; Adam, Klaus; and Horn, Heinz, to L. Schuler GmbH. Drawing device for presses with mechanically driven drawing ram. 4,499,750, Cl. 72-351.000.

Gerber, James E.; Kovacs, Robert J.; and Herrmann, Willy, to APX Group, Inc. Flange weld technique. 4,500,030, Cl. 228-125.000.

Gere, Dennis R.: *See*—
Poole, John S.; Gere, Dennis R.; Bell, Raymond J.; and Nickerson, Mark A., 4,500,432, Cl. 210-659.000.

Geren, George W.: *See*—
Miles, Ronald C.; Geren, George W.; and Peel, R. W., 4,500,402, Cl. 204-242.000.

Gerteisen, Steven R.; Wenger, Richard M.; and Cannavo, Glenn M., to Plastic Specialties and Technologies, Inc. Stainless steel fiber-thermosplastic granules and molded articles therefrom. 4,500,595, Cl. 428-294.000.

Gesing, Adam J.; and Stratford, Graham, to Alcan International Limited. Shaped refractory metal boride articles and method of making them. 4,500,643, Cl. 501-96.000.

Giavelli, Giordano: *See*—
Carraroli, Dario; and Giavelli, Giordano, 4,500,287, Cl. 432-246.000.

Gibson, Larry A.: *See*—
Sasnett, Michael W.; Hobart, James L.; and Gibson, Larry A., 4,500,996, Cl. 372-19.000.

Gilev, Anatoly P.: *See*—
Grinberg, Grigory M.; Akifiev, Oleg N.; Pytel, Jury A.; Gilev, Anatoly P.; and Paberza, Monika Y., 4,500,516, Cl. 424-156.000.

Gillette Company, The: *See*—
Nigro, Louis V., 4,500,061, Cl. 248-359.00I.

Gillingham, Gary R., to Donaldson Company, Inc. Throughput blade for louvered separators. 4,500,332, Cl. 55-443.000.

Gimel, Bernard; and DeFay, Christian, to Thomson-CSF. Process for printing dots on a heat sensitive paper by a thermal printer and printer using this process. 4,500,891, Cl. 346-76.0PH.

Girlock Limited: *See*—
Wang, Nui, 4,499,977, Cl. 188-72.600.

Girodi, Erich; Bornowski, Gunter; Dejmek, Eberhard; Knabe, Andreas; Koch, Roland; Urbach, Bernd; and Weisselberg, Arnold, to VEB Gaskombinat Schwarze Pumpe. Device for internal welding of pipes or the like. 4,500,764, Cl. 219-59.100.

Gist-Brocades N.V.: *See*—
Apontoweil, Peter; and Krasselt, Manfred M., 4,500,638, Cl. 435-235.000.

Gitlin, Harvey S.; and Duffy, John J. Coin slide with coin drop delay means. 4,499,983, Cl. 194-1.00G.

Givaudan Corporation: *See*—
Lamparsky, Dietmar; and Kaiser, Roman, 4,500,729, Cl. 560-225.000.

Glaser, Roger M.: *See*—
Petrofsky, Jerrold S.; Phillips, Chandler A.; Glaser, Roger M.; and Heaton, Harry H., III, 4,499,900, Cl. 128-423.00W.

Godfrey, Jollie D., Jr.: *See*—
Gordon, Eric M., and Godfrey, Jollie D., Jr., 4,500,518, Cl. 514-2.000.

Goekler, Robert G., to Crutcher Resources Corporation. Pipeline priming method and system. 4,500,570, Cl. 427-345.000.

Goertz, Arnold E.; and Guinn, Ronald K., to Hesston Corporation. Two-way knife adjustment for crop harvester cutting cylinder. 4,500,042, Cl. 241-238.000.

Goldco Engineering, Inc.: *See*—
Cole, Rodger E.; and Vander Meer, Richard H., 4,500,229, Cl. 406-88.000.

Golden, Donald M.: *See*—
DiGiovanni, John; and Golden, Donald M., 4,500,024, Cl. 227-19.000.

Goldhamer, Walter M. Modified pressure casting process and machine. 4,499,941, Cl. 164-313.000.

Goldman, Fred M.: *See*—
Csaszar, Gabor; Oehley, Gernot F.; and Goldman, Fred M., 4,500,475, Cl. 261-36.00A.

Goldsby, George M. Apparatus for replacing a chain. 4,499,644, Cl. 29-281.600.

Goldstein, Joel, to Aquarium Pharmaceuticals, Inc. Damaged fish tissue treating method and composition containing *Aloe vera* extract. 4,500,510, Cl. 424-80.000.

Goldstein, Leon C., to An-Rix, Inc. Cold recapping method for tires utilizing uncured rubber. 4,500,375, Cl. 156-96.000.

Golovanov, Alexandr V.: *See*—
Eschenko, Vladislav Y.; Musaev, Irsali K.; Talibdzhanov, Zakhidzhan S.; Leonov, Viktor A.; Bobrov, Anatoly D.; Kirovsky, Efim I.; Gritsenko, Vladimir A.; and Golovanov, Alexandr V., 4,500,282, Cl. 431-184.000.

Gomersall, Earl R.; and Cipolla, Arthur F., to Motorola, Inc. Real time, computer-driven retail pricing display system. 4,500,880, Cl. 340-825.350.

Goodson, Theodore, Jr.: *See*—
Spitzer, Wayne A.; and Goodson, Theodore, Jr., 4,500,456, Cl. 260-239.00A.

Goodyear Tire & Rubber Company, The: *See*—
Schisler, Robert C.; and Eisenzimmer, George W., 4,500,095, Cl. 277-34.000.

Gordon, Eric M.; and Godfrey, Jollie D., Jr., to E. R. Squibb & Sons, Inc. Amino thiol dipeptides. 4,500,518, Cl. 514-2.000.

Goseberg, Walter: *See*—
Napp, Gerhard; Bieringer, Ulrich; Kreismer, Heinz; and Goseberg, Walter, 4,500,833, Cl. 323-359.000.

Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., to Ciba-Geigy Corporation. Process for preparing thia-aza compounds with a beta-lactam ring. 4,500,457, Cl. 260-245.20R.

Goto, Toshiki: *See*—
Asano, Hisoshi; Shimamune, Takayuki; Goto, Toshiki; and Hosonuma, Masashi, 4,500,405, Cl. 204-290.00F.

Goto, Toshio: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, 4,500,342, Cl. 71-93.000.

Goto, Tsutomu: *See*—
Akano, Shinichi; Goto, Tsutomu; Watanabe, Hiroshi; Kuroda, Masato; Ishikawa, Sakae; and Matsumoto, Ryoichiro, 4,499,754, Cl. 73-861.120.

Gotou, Makoto; and Okamoto, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Current control circuit for a plurality of loads. 4,500,830, Cl. 323-267.000.

Gottlieb, Milton: *See*—
Schaff, Fredrick L.; and Gottlieb, Milton, 4,500,175, Cl. 350-358.000.

Gould, Ashley M.: *See*—
Wyatt, Michael; Leach, Gary M.; and Gould, Ashley M., 4,500,650, Cl. 502-204.000.

Goyert, Wilhelm; Grimm, Wolfgang; Awater, Albert; Wagner, Hans; and Kruger, Bruno, to Bayer Aktiengesellschaft. Reinforced polyurethane thermoplastic chemical materials and processes for their preparation. 4,500,671, Cl. 524-494.000.

Gradco Systems, Inc.: *See*—
DuBois, R. Clark, 4,500,087, Cl. 271-293.000.

Graff, Eugene A., to North American Philips Lighting Corporation. Fluorescent lamp having integral light-filtering means and starting aid. 4,500,810, Cl. 313-486.000.

Graham, Thomas G.: *See*—
Blackwood, John; Graham, Thomas G.; and Brauch, Robert B., 4,499,839, Cl. 112-317.000.

Grantham, LeRoy F., to Rockwell International Corporation. Thermal conversion of wastes. 4,499,833, Cl. 110-342.000.

Granzow, Daniel B.: *See*—
Kulin, Ralph; Granzow, Daniel B.; and Danielsen, Brant R., 4,500,788, Cl. 250-455.100.

Graphic Controls Corp.: *See*—
Katsen, Boris J.; Brinkworth, Robert T.; Kay, Daniel J.; and Riester, James A., 4,500,354, Cl. 106-21.000.

Grappendorf, Richard H.; and West, Jana L., to Christensen, Inc. Tooth configuration for an earth boring bit. 4,499,959, Cl. 175-330.000.

Gras, Rainer, to Chemische Werke Huls Aktiengesellschaft. Powder surface coatings. 4,500,696, Cl. 528-45.000.

Gras, Rainer: *See*—
Disteldorf, Josef; and Gras, Rainer, 4,500,697, Cl. 528-45.000.
Disteldorf, Josef; and Gras, Rainer, 4,500,698, Cl. 528-45.000.

Grassme, Ulrich, to Siemens Aktiengesellschaft. Dental X-ray diagnostic installation. 4,501,010, Cl. 378-38.000.

Gratch, Eitan: *See*—
Austin, James W.; Bradburn, Ronald G.; Cromwell, Clarence A.; Gratch, Eitan; Groiss, Erich; Perkins, Derek; and Walker, Robert A., 4,500,496, Cl. 423-55.000.

Graves, Toby R.: *See*—
Woods, John H.; Graves, Toby R.; Nasser, William E.; and Jagtap, Ashvinkumar N., 4,500,359, Cl. 106-270.000.

Graves, Walter E.: *See*—
Boys, Donald R.; and Graves, Walter E., 4,500,407, Cl. 204-298.000.
Boys, Donald R.; and Graves, Walter E., 4,500,409, Cl. 204-298.000.

Gray, Hamish W. M.: *See*—
English, Brian B.; and Gray, Hamish W. M., 4,500,876, Cl. 340-709.000.

Gray, Hollis L., Jr.: *See*—
Crampton, Arthur W.; Gray, Hollis L., Jr.; and Mermelstein, Seymour, 4,499,773, Cl. 73-718.000.

Gray, Martin D., to Cipher Data Products, Inc. Capstanless magnetic tape drive with electronic equivalent to length of tape. 4,500,965, Cl. 364-400.000.

Great Lakes Carbon Corporation: *See*—
Clark, James M.; Secrist, Duane R.; Hardin, Scotty L.; and McEntyre, Stephen C., 4,500,401, Cl. 204-225.000.

Greenberg, Mishel; Smyers, William H., Jr.; and Chernack, Milton, to Chesebrough-Pond's Inc. Apparatus for measuring human respiration. 4,499,905, Cl. 128-727.000.

Greene, Ted R., to United Security Products, Inc. Electronic panel. 4,500,943, Cl. 361-383.000.

Greenway, John M., to Milliken Research Corporation. Method for the production of materials having visual surface effects. 4,499,637, Cl. 26-2.00R.

Gregg, David P., to Discovision Associates. Process for making a video record disc. 4,500,484, Cl. 264-107.000.

Grelan Pharmaceutical Co., Ltd.: *See*—
Kigasawa, Kazuo; Ohtani, Hideaki; and Kanezuka, Toshiyuki, 4,500,511, Cl. 424-81.000.

Grey, James T., Jr., to Thiokol Corporation. Device for controlled differential flow. 4,500,114, Cl. 280-742.000.

Gries, Josef: *See*—
Kubinyi, Hugo; Traut, Martin; and Gries, Josef, 4,500,467, Cl. 514-2.000.

Griffin, John R.: *See*—
Garganese, Ugo S.; Griffin, John R.; and Martin, Raymond H., 4,500,289, Cl. 433-54.000.

Grimm, Maurice, to Ebauches, S.A. Ultra-flat self-winding watch. 4,500,213, Cl. 368-208.000.

Grimm, Wolfgang: *See*—
Goyert, Wilhelm; Grimm, Wolfgang; Awater, Albert; Wagner, Hans; and Kruger, Bruno, 4,500,671, Cl. 524-494.000.

Grinberg, Grigory M.; Akifiev, Oleg N.; Pytel, Jury A.; Gilev, Anatoly P.; and Paberza, Monika Y., to Institut Organicheskogo Sinteza Akademii Nauk Latviiskoi SSR. Antibacterial pharmaceutical composition. 4,500,516, Cl. 424-156.000.

Griset, Norman. Guide clamp. 4,499,667, Cl. 33-446.000.

Gritsenko, Vladimir A.: *See*—
Eschenko, Vladislav Y.; Musaev, Irsali K.; Talibdzhanov, Zakhidzhan S.; Leonov, Viktor A.; Bobrov, Anatoly D.; Kirovsky, Efim I.; Gritsenko, Vladimir A.; and Golovanov, Alexandr V., 4,500,282, Cl. 431-184.000.

Grobner, Paul J.: *See*—
Bond, Armand P.; Poznansky, Abraham; and Grobner, Paul J., 4,500,351, Cl. 75-128.00N.

Grodinsky, Robert. Audio amplifier apparatus with minimum non-linear distortion. 4,500,850, Cl. 330-307.000.

Groh, Edward F.; Cassidy, Dale A.; and Lewandowski, Edward F., to United States of America, Energy. Encapsulated fuel unit and method of forming same. 4,500,488, Cl. 376-409.000.

Groiss, Erich: *See*—
Austin, James W.; Bradburn, Ronald G.; Cromwell, Clarence A.; Gratch, Eitan; Groiss, Erich; Perkins, Derek; and Walker, Robert A., 4,500,496, Cl. 423-55.000.

Grossman, Harvey L., to Forms & Surfaces. Door pull mounting and locking assembly. 4,499,629, Cl. 16-111.00R.

Gruber, Werner: *See*—
Herold, Julius; Gruber, Werner; and Henke, Guenter, 4,500,604, Cl. 428-414.000.

Grunert, Heinz; Hahn, Fritz; Rall, Ulrich; Schumann, Klaus; Schwuger, Milan J.; and Smolka, Heinz G., to Henkel Kommanditgesellschaft auf Aktien. Use of fine-particulate alkali metal aluminosilicates in the process of dye soaping. 4,500,320, Cl. 8-442.000.

Gruns, James H. Flexible surface cleaning and coatings applicator tool. 4,499,627, Cl. 15-210.00R.

Gruppo Lepetit S.p.A.: *See*—
Winters, Giorgio; Sala, Alberto; and Barone, Domenico, 4,500,525, Cl. 514-210.000.

GTE Communications Products Corporation: *See*—
Maiocchi, John, 4,499,848, Cl. 118-45.000.

GTE Products Corporation: *See*—
Blaisdell, Ronald G.; and Gagnon, Peter R., 4,500,948, Cl. 362-382.000.
Roche, William J., 4,500,812, Cl. 315-171.000.

Guckenheimer, Peter U., to Hewlett-Packard Company. Keyboard switch assembly having sensory feedback. 4,500,758, Cl. 200-5.00A.

Gueret, Jean-Louis H., to L'Oreal. Hair brush with a flexible base plate made of a plastic material. 4,500,939, Cl. 361-221.000.

Guffroy, Gerard, to De Dietrich & Cie. Process for enamelling objects electrostatically by means of a gun. 4,500,560, Cl. 427-8.000.

Guinn, Ronald K.: *See*—
Goertz, Arnold E.; and Guinn, Ronald K., 4,500,042, Cl. 241-238.000.

Gulf Oil Corporation: *See*—
Lakshmanan, Pallavoor R., 4,500,661, Cl. 524-77.000.

Gulling, Donna C.: *See*—
Davis, Sammy G.; and Gulling, Donna C., 4,500,291, Cl. 433-213.000.

Gulton Industries, Inc.: *See*—
Burkarth, Jack L., 4,499,815, Cl. 98-40.140.

Gunn, Walter H.; and Kennedy, Alexander W. Corrosion resistant substrate with metallic undercoat and chromium topcoat. 4,500,610, Cl. 428-624.000.

Gustafsson, Erik, to Plannja AB. Roofing sheet. 4,499,700, Cl. 52-478.000.

Guthrie, James L.; and Wojcik, Ronald T., to W. R. Grace & Co. Reactive adhesive dispersion and method of use. 4,500,703, Cl. 523-400.000.

Gutleber, Frank S., to United States of America, Army. Adaptive multiple interference tracking and cancelling antenna. 4,500,883, Cl. 343-383.000.

H. B. Fuller Co.: *See*—
Luss, V. Gerold, 4,500,517, Cl. 424-162.000.

H. King & Associates, Ltd.: *See*—
King, Homer F., 4,500,148, Cl. 312-312.000.

Haag, Werner O.: *See*—
Chen, Nai Y.; Haag, Werner O.; Huang, Tracy J.; and Wong, Stephen S., 4,500,417, Cl. 208-111.000.

Haas, Wendall M. B., to United States of America, Energy. Flexural support member having a high ratio of lateral-to-axial stiffness. 4,499,772, Cl. 73-666.000.

Haber, Stephen B., to Du Pont de Nemours, E. I., and Company. Antiinflammatory and/or analgesic silylfurans. 4,500,520, Cl. 514-63.000.

Haberl, Johann K. Side-channel pump. 4,500,253, Cl. 415-53.00T.

Habicht, Ernst; and Zbinden, Paul, to Ciba-Geigy Corporation. Dioxaheterocyclic compounds. 4,500,542, Cl. 514-465.000.

Hackett, Robert J., to Haly, Inc. Molten metal samplers. 4,499,777, Cl. 73-864.560.

Hacova, Kveta: *See*—
Junek, Jan; Skarka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Hacova, Kveta; Vobornik, Vaclav; Ohlidal, Vladimi; and Lihtarova, Ludmila, 4,499,718, Cl. 57-301.000.

Hacskaylo, Michael. Automatic human body detector. 4,500,784, Cl. 250-341.000.

Haeck, Paul J., to Miller Hofft, Inc. Combination dryer and surge bin. 4,499,669, Cl. 34-102.000.

Haentjens, Yan: *See*—
Marchand, Maurice; and Haentjens, Yan, 4,500,848, Cl. 330-285.000.

Hagiri, Minoru: *See*—
Kubo, Keishi; Watanabe, Hideo; Takigawa, Nobuhiro; Hagiri, Minoru; and Kawasaki, Kanjiro, 4,500,896, Cl. 346-204.000.

Hagiwara, Hitoshi: *See*—
Kita, Nobuyuki; Matsumoto, Hiroshi; and Hagiwara, Hitoshi, 4,500,625, Cl. 430-149.000.

Hagler, Gerald E.: *See*—
Mathis, Ronald D.; Reed, Jerry O.; and Hagler, Gerald E., 4,500,706, Cl. 528-502.000.

Hahn, Fritz: *See*—
Grunert, Heinz; Hahn, Fritz; Rall, Ulrich; Schumann, Klaus; Schwuger, Milan J.; and Smolka, Heinz G., 4,500,320, Cl. 8-442.000.

Hahn, Terrence P. Protective pad. 4,500,129, Cl. 294-172.000.

Haight, Robert E.: *See*—
Jacobi, Stephen F.; Haight, Robert E.; Schletzbaum, John W.; Martin, Yolanda E.; and Lang, Stephen P., 4,500,874, Cl. 340-607.000.

Haines, Richard M.: *See*—
Wong, Robert; Flautt, Martin C.; and Haines, Richard M., 4,500,600, Cl. 428-391.000.

Hajto, Ernest A., to Du Pont Canada Inc. Emulsion blasting agent. 4,500,370, Cl. 149-109.600.

Halkey-Roberts Corporation: *See*—
Zimmerly, Harry L., 4,499,968, Cl. 184-18.000.
Zimmerly, Harry L., 4,500,014, Cl. 222-5.000.

Hall, Charles B.; and Mondek, Martin J., to Outboard Marine Corporation. Control system for torque correcting device. 4,500,298, Cl. 440-62.000.

Hall, Robert T., to Williams International Corporation. Casting process including making and using an elastomeric pattern. 4,499,940, Cl. 164-36.000.

Hall, William M.: *See*—
Burns, Richard H.; Hall, William M.; and Hildebrand, Bernard P., 4,500,163, Cl. 350-3.700.

Hallford, Ben R., to Rockwell International Corporation. Transistor amplifier variable matching transformer apparatus. 4,500,847, Cl. 330-277.000.

Halliburton Company: *See*—
Brothers, Lance E.; and Rao, S. Prabhakara, 4,500,357, Cl. 106-90.000.
Roberts, Don M.; and Looper, David W., 4,500,944, Cl. 361-384.000.

Haly, Inc.: *See*—
Hackett, Robert J., 4,499,777, Cl. 73-864.560.

Hamada, Hideo: *See*—
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Futagi, Masaaki, 4,499,979, Cl. 192-3.310.

Hamada, Mitsuo: *See*—
Kobayashi, Hideki; and Hamada, Mitsuo, 4,500,447, Cl. 252-511.000.

Hamada, Nobuhiro: *See*—
Sugimoto, Norihiko; Hamada, Nobuhiro; Masuda, Ikuro; and Sakurai, Jinichi, 4,500,951, Cl. 364-186.000.

Hamada, Takeshi; and Komatsubara, Yoshinobu, to Mitsui Mining Company Ltd. Method of removing sulfur oxides and nitrogen oxides by dry process. 4,500,501, Cl. 423-239.000.

Hamada, Yasufumi: *See*—
Tanaka, Toru; Hataya, Masanori; Tanaka, Kazuo; Sakai, Yukio; and Hamada, Yasufumi, 4,500,730, Cl. 562-416.000.

Hamaguchi, Hiroshi: *See*—
Fukami, Akira; Noguchi, Hiroki; and Hamaguchi, Hiroshi, 4,500,479, Cl. 261-98.000.

Hamalainen, Kaarlo J.; and Reitmeier, Glenn A., to RCA Corporation. Television signal standards conversion using a helical scan VTR. 4,500,930, Cl. 358-310.000.

Hamamatsu, Seiji: *See*—
Kubota, Hitoshi; Hamamatsu, Seiji; Yambe, Teluo; and Takahashi, Toshiyuki, 4,500,761, Cl. 200-84.00C.

Hamamuro, Naozi: *See*—
Shima, Toshiaki; Hamamuro, Naozi; Ikari, Shinichi; and Fuzishiro, Tuneo, 4,499,929, Cl. 141-1.100.

Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; and Tanaka, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for automatically starting and stopping engine. 4,500,794, Cl. 290-38.00C.

Hamblett, Martin: *See*—
Dodd, Alec G.; and Hamblett, Martin, 4,500,258, Cl. 416-97.00R.

Hamilton, James G.; Sullivan, Ann C.; Tobias, Lawrence D.; and Triscari, Joseph, to Hoffmann-La Roche Inc. Thromboxane synthase inhibitors as insulin lowering agents and antionbesity agents. 4,500,540, Cl. 514-397.000.

Hamm, James R.; and Young, William E., to KRW Energy Systems Inc. High temperature gas turbine systems. 4,499,722, Cl. 60-39.120.

Hammer, Heiner I., to Schlegel Lining Technology GmbH. Concrete pipe with an inner lining. 4,499,923, Cl. 138-109.000.

Hammill, S. Scott, to SL Industries, Inc. Universal outlet. 4,500,152, Cl. 339-61.00M.

Hamon, Christian: *See*—
Denise, Bernard; Hamon, Christian; Senes, Michel; and Sneeden, Raymond, 4,500,646, Cl. 502-78.000.
Hanamoto, Hiroyuki; and Horie, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Timing control system for determining abnormal motor operation. 4,500,957, Cl. 364-200.000.
Hancock, Robert D.: *See*—
Pettingell, James T., 4,500,031, Cl. 228-179.000.
Haneda, Satoshi; Itaya, Masahiko; and Tanaka, Minoru, to Konishiroku Photo Industry Co., Ltd. Extraction developing method for electrostatic latent images. 4,500,616, Cl. 430-45.000.
Hanlon, Allan J., to Devro, Inc. End closure for sausage casings. 4,500,574, Cl. 428-35.000.
Hanma, Kentaro; Murakami, Toshio; and Todaka, Yoshihiro, to Hitachi, Ltd. Auto-focusing system for video camera. 4,500,925, Cl. 358-227.000.
Hanna, Marie R.: *See*—
Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., 4,500,448, Cl. 252-522.00R.
Hansen, Leif J.: *See*—
Hunt, Arlon J.; Hansen, Leif J.; and Evans, David B., 4,499,893, Cl. 126-449.000.
Hanson, John D.; and Cook, John E., to Allied Corporation. Vacuum check valve. 4,499,916, Cl. 137-103.000.
Hanson, Raymond; and Tillyard, Malcolm, to USM Corporation. Method and apparatus for use in heating shoe parts. 4,500,773, Cl. 219-215.000.
Hara, Hiroshi: *See*—
Aono, Toshiaki; Hara, Hiroshi; and Naito, Hideki, 4,500,624, Cl. 430-138.000.
Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; Sato, Kozo; and Fujita, Shinsaku, 4,500,626, Cl. 430-203.000.
Haraguchi, Keisuke: *See*—
Morizumi, Masaaki; Kando, Toru; and Haraguchi, Keisuke, 4,500,184, Cl. 354-149.110.
Haraguchi, Shosuke; and Tosaka, Yoichi, to Canon Kabushiki Kaisha. Film transportation device for camera. 4,500,185, Cl. 354-209.000.
Harbert, Charles A.: *See*—
Lombardino, Joseph G.; and Harbert, Charles A., 4,500,535, Cl. 514-277.000.
Hardee, Kim C.: *See*—
Sud, Rahul; and Hardee, Kim C., 4,500,799, Cl. 307-449.000.
Hardin, Scotty L.: *See*—
Clark, James M.; Secrist, Duane R.; Hardin, Scotty L.; and McEntyre, Stephen C., 4,500,401, Cl. 204-225.000.
Hareng, Michel; and Moutou, Paul, to Thomson-CSF. Thermoelectrically controlled electrochromatic visualization device. 4,500,878, Cl. 340-713.000.
Harer, Helmut: *See*—
Ahner, Peter; Harer, Helmut; and Schustek, Siegfried, 4,500,772, Cl. 219-209.000.
Harmand, Michel, to Automobiles Citroen; and Automobiles Peugeot. Vehicle seat. 4,500,130, Cl. 296-65.00R.
Harms, Orville L., to Timpte Industries, Inc. Apparatus and method for locking doors. 4,500,123, Cl. 292-259.00A.
Harris Graphics Corporation: *See*—
Ruetschle, Rudolph H.; and Raker, John W., 4,499,834, Cl. 112-2.000.
Harris, Ronald R., to Kemfast Textiles, Inc. Stretchable knitted article with printed design. 4,499,741, Cl. 66-171.000.
Harris, Stephen K.; and Miller, Wiley W., to Tappan Company, The. Manual control knob with adjustable pointer assembly. 4,499,630, Cl. 16-121.000.
Hart, Robert G.; and Townsend, Herbert E., to Bethlehem Steel Corporation. Method of producing metal-filled organic coating. 4,500,399, Cl. 204-181.00C.
Hartung, Michael H.: *See*—
Duke, Alan H.; Hartung, Michael H.; Marschner, Frederick J.; and Nolan, Kenneth P., 4,500,954, Cl. 364-200.000.
Hartwig, Jurgen: *See*—
Meier, Gunter; Meier, Willi; and Hartwig, Jurgen, 4,499,836, Cl. 112-158.00E.
Harwood, Leopold A., to RCA Corporation. Hue control system. 4,500,910, Cl. 358-28.000.
Hasegawa, Eiichi: *See*—
Wada, Minoru; Takahashi, Yonosuke; and Hasegawa, Eiichi, 4,500,889, Cl. 346-1.100.
Hasegawa, Katsuji; and Ibuki, Yasuhiro, to Meinan Machinery Works, Inc. Veneer lathe. 4,499,935, Cl. 144-209.00R.
Hasegawa, Satoshi, to Nippon Electric Co., Ltd. Loop transmission system. 4,500,987, Cl. 370-60.000.
Hashimoto, Junichi, to Pentel Kabushiki Kaisha. Mechanical pencil with removable lead feed cover. 4,500,220, Cl. 401-53.000.
Hashimoto, Seiji; Tanaka, Nobuyoshi; Suga, Akira; and Kuwayama, Tetsuro, to Canon Kabushiki Kaisha. Solid-state color image sensing device. 4,500,913, Cl. 358-44.000.
Hashimoto, Shintaro; Masuzawa, Sigeaki; Shibata, Shinya; Tsuda, Hiroshi; and Nakano, Masahiro, to Sharp Kabushiki Kaisha. Audibly announcing apparatus with power saving feature. 4,500,211, Cl. 368-63.000.
Hasselmann, Heinz; and Muenzebrock, Anton, to Mannesmann Aktiengesellschaft. Method and apparatus for determining stress on hoisting equipment. 4,500,969, Cl. 364-508.000.
Hatada, Toshio: *See*—
Kuroda, Shigeaki; Senshu, Takao; Oguni, Kensaku; Mochizuki, Taketoshi; Yasuda, Hiromu; Ishibane, Kyuhei; Atsumi, Akira; Kimura, Hideyuki; and Hatada, Toshio, 4,500,035, Cl. 236-92.00B.
Hatae, Masamiti: *See*—
Misaka, Yoshiharu; Teraue, Takeshi; and Hatae, Masamiti, 4,500,652, Cl. 521-33.000.
Hataya, Masanori: *See*—
Tanaka, Toru; Hataya, Masanori; Tanaka, Kazuo; Sakai, Yukio; and Hamada, Yasufumi, 4,500,730, Cl. 562-416.000.
Hatayama, Tamothu: *See*—
Nozaki, Hidetoshi; Kamimura, Takaaki; Hatayama, Tamothu; and Utagawa, Tadashi, 4,500,744, Cl. 136-258.000.
Hattori, Kazuhide: *See*—
Yazaki, Takao; Hattori, Kazuhide; Hattori, Satoru; Hayama, Kazuhide; and Itoh, Isao, 4,500,597, Cl. 428-317.700.
Hattori, Satoru: *See*—
Yazaki, Takao; Hattori, Kazuhide; Hattori, Satoru; Hayama, Kazuhide; and Itoh, Isao, 4,500,597, Cl. 428-317.700.
Hauck, Robert B.; and Susami, Larry, to General Electric Company. Angulating lateral fluoroscopic suspension. 4,501,011, Cl. 378-196.000.
Hauer, Jean-Claude: *See*—
Oger, Jacques; Hauer, Jean-Claude; and Freis, Jean-Louis, 4,499,695, Cl. 52-19.000.
Haug, Theobald: *See*—
Stockinger, Friedrich; and Haug, Theobald, 4,500,691, Cl. 525-503.000.
Haugen, Olav A.: *See*—
Tvedt, Kare E.; Kopstad, Guennar; and Haugen, Olav A., 4,499,670, Cl. 34-143.000.
Hauni-Werke Korber & Co. KG: *See*—
Vock, Jurgen; Pinck, Peter; Lange, Norbert; Schmalfeld, Erwin; and Petersen, Kurt-Eckard, 4,500,770, Cl. 219-121.0LK.
Haury, Gilbert E.; Patel, Nathalal G.; Lockard, Walter G.; and Wiatrak, Thomas R., to Invacare Corporation. Sports wheelchair. 4,500,102, Cl. 280-242.0WC.
Hausberg, Hans-Heinrich; Uhl, Jurgen; Seyfried, Christoph; and Minck, Klaus-Otto, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Pharmacologically active cyclopropane derivatives. 4,500,541, Cl. 514-466.000.
Hausmann, Heinz; Niessen, Heinz J.; Telle, Otto; and Neumaier, Hermann, to Bayer Aktiengesellschaft. Oil-in-water emulsions, and their use. 4,500,348, Cl. 71-103.000.
Hawe-Neos Dental Dr. H. v. Weissenfluh S.A.: *See*—
von Weissenfluh, Hans C., 4,500,288, Cl. 433-40.000.
Hay, Robert A., II; and Krause, Brian W., to Dow Chemical Company, The. Tubing perforator. 4,499,749, Cl. 72-325.000.
Hayakawa, Kiyoharu: *See*—
Takahashi, Hideaki; Hayakawa, Kiyoharu; Kondo, Haruyoshi; and Takeuchi, Takashi, 4,500,412, Cl. 204-425.000.
Hayama, Kazuhide: *See*—
Yazaki, Takao; Hattori, Kazuhide; Hattori, Satoru; Hayama, Kazuhide; and Itoh, Isao, 4,500,597, Cl. 428-317.700.
Hayashi, Akira: *See*—
Nagamine, Akio; Hayashi, Akira; Yoshida, Kazumasa; and Miyasaka, Kojiro, 4,500,614, Cl. 429-206.000.
Hayashi, Katsumi: *See*—
Ohmura, Kunioki; Torigoe, Masaaki; Itoh, Isamu; and Hayashi, Katsumi, 4,500,632, Cl. 430-428.000.
Hayashi, Yutaka; Yamanaka, Mithuyuki; Iida, Hideyo; Shiba, Nobuyasu; Karasawa, Hideyuki; Mishuku, Toshio; and Itou, Atsuo, to Kogyo Gijutsuin; and Taiyo Yuden Kabushiki Kaisha. Amorphous semiconductor solar cell having a grained transparent electrode. 4,500,743, Cl. 136-258.000.
Hayes, James C. Self induced laser magnetohydrodynamic (MHD) electric generator. 4,500,803, Cl. 310-11.000.
Hayes, Robert A.; and Conard, Wendell R., to Firestone Tire & Rubber Company, The. Method for preparing a zinc dimethacrylate powder having a specific surface area range. 4,500,466, Cl. 260-429.900.
Hays, Dan A.: *See*—
Kopko, John J.; and Hays, Dan A., 4,499,851, Cl. 118-658.000.
Heaton, Harry H., III: *See*—
Petrofsky, Jerrold S.; Phillips, Chandler A.; Glaser, Roger M.; and Heaton, Harry H., III, 4,499,900, Cl. 128-423.00W.
Hecht, Betsalel; and Hecht, Silviu. Means for loading fowl onto a transporting vehicle. 4,499,856, Cl. 119-82.000.
Hecht, Silviu: *See*—
Hecht, Betsalel; and Hecht, Silviu, 4,499,856, Cl. 119-82.000.
Heidelberger Druckmaschinen AG: *See*—
Fischer, Rudolf; and Spiegel, Nikolaus, 4,499,760, Cl. 73-159.000.
Heidemeyer, Paulus: *See*—
Oetting, Hermann; and Heidemeyer, Paulus, 4,499,965, Cl. 180-165.000.
Heikes, James E.: *See*—
Sprague, Peter W.; and Heikes, James E., 4,500,723, Cl. 549-459.000.
Heikkila, Sakari, to A. Ahlstrom Osakeyhtio. Method and apparatus for detecting grain direction in wood, particularly in lumber. 4,500,835, Cl. 324-58.50R.
Heinecke, Steven B., to Minnesota Mining and Manufacturing Co. Reservoir wound dressing. 4,499,896, Cl. 128-156.000.
Heling, Dennis: *See*—
Murphy, Randall T.; and Heling, Dennis, 4,500,136, Cl. 297-284.000.
Heller, Andrew R.; and Worley, William S., Jr., to International Business Machines Corporation. Mechanism for control of address trans-

lation by a program using a plurality of translation tables. 4,500,952, Cl. 364-200.000.
Helms, Dirk, to FaJungheinrich Unternehmensverwaltung KG. Swivel head for industrial robots. 4,499,790, Cl. 74-665.00C.
Henke, Guenter: *See*—
Herold, Julius; Gruber, Werner; and Henke, Guenter, 4,500,604, Cl. 428-414.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Grunert, Heinz; Hahn, Fritz; Rall, Ulrich; Schumann, Klaus; Schwuger, Milan J.; and Smolka, Heinz G., 4,500,320, Cl. 8-442.000.
Herold, Julius; Gruber, Werner; and Henke, Guenter, 4,500,604, Cl. 428-414.000.
Hennekes, Daniel M.; Suica, David E.; and Beckman, Robert F., to Cincinnati Milacron Inc. Releasable tool mount for manipulator. 4,500,065, Cl. 248-542.000.
Henrick, Clive A., to Zoecon Corporation. Compositions. 4,500,737, Cl. 568-329.000.
Herberg, Helmut, to Siemens Aktiengesellschaft. FET Controlled thyristor. 4,500,902, Cl. 357-38.000.
Hermann Wangner GmbH & Co KG: *See*—
Borel, Georg, 4,499,927, Cl. 139-425.00A.
Herold, Julius; Gruber, Werner; and Henke, Guenter, to Henkel Kommanditgesellschaft auf Aktien. Bondings and composite films. 4,500,604, Cl. 428-414.000.
Herrmann, Willy: *See*—
Gerber, James E.; Kovacs, Robert J.; and Herrmann, Willy, 4,500,030, Cl. 228-125.000.
Hesston Corporation: *See*—
Goertz, Arnold E.; and Guinn, Ronald K., 4,500,042, Cl. 241-238.000.
Hewlett-Packard Company: *See*—
Buck, Roy T.; Cloutier, Frank L.; Erni, R. Ernst; Low, Robert N.; and Terry, F. Duncan, 4,500,895, Cl. 346-140.00R.
Guckenheimer, Peter U., 4,500,758, Cl. 200-5.00A.
Poole, John S.; Gere, Dennis R.; Bell, Raymond J.; and Nickerson, Mark A., 4,500,432, Cl. 210-659.000.
Higashi, Hidehiro: *See*—
Fuchikami, Jun; Higashi, Hidehiro; Inoue, Takashi; and Oba, Hiroyuki, 4,500,643, Cl. 502-65.000.
Higgins, Mary L.; and Muri, David L., to Motorola, Inc. Switch controller for obtaining a plurality of functions from a single switch in a two-way transceiver and method therefor. 4,501,017, Cl. 455-78.000.
Hihara, Toshio: *See*—
Niwa, Toshio; Hihara, Toshio; and Shimizu, Yukiharu, 4,500,455, Cl. 534-635.000.
Niwa, Toshio; and Hihara, Toshio, 4,500,710, Cl. 544-113.000.
Hildebrand, Bernard P.: *See*—
Burns, Richard H.; Hall, William M.; and Hildebrand, Bernard P., 4,500,163, Cl. 350-3.700.
Hill, Kenneth W.: *See*—
Winkelbauer, Howard M.; Hill, Kenneth W.; and Wang, Ke-Chin, 4,500,644, Cl. 501-98.000.
Hill, Phillip E.: *See*—
Lawrence, Robert H., Jr.; and Hill, Phillip E., 4,499,687, Cl. 47-58.000.
Hill, Richard W.; Skinner, Dewey F.; and Thorsness, Charles B., to United States of America, Energy. Silane-propane ignitor/burner. 4,499,945, Cl. 166-50.000.
Hills, Maynard J.: *See*—
Janisiewicz, Stanley W.; Hills, Maynard J.; and Lovell, Edward J., 4,500,246, Cl. 414-414.000.
Hinds, Kenneth W. Diesel fuel heater. 4,499,886, Cl. 123-557.000.
Hino, Toshiyuki; and Masuno, Katsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition system for internal combustion engine. 4,499,888, Cl. 123-615.000.
Hinohara, Yoshikazu: *See*—
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.
Hioki, Shunichi: *See*—
Tanaka, Kyoichi; Tsuzuki, Akira; and Hioki, Shunichi, 4,500,441, Cl. 252-89.100.
Hiramoto, Tatsumi, to Ushio Denki Kabushiki Kaisha. Deposition process. 4,500,565, Cl. 427-39.000.
Hirano, Seiichi, to Epson Corporation. Serial thermal printer. 4,500,892, Cl. 346-76.0PH.
Hirano, Yoshinori, to Nissan Motor Company, Limited. Cylinder head for internal combustion engine. 4,499,866, Cl. 123-41.210.
Hirata, Sadao: *See*—
Maruhashi, Yoshitsugu; Kano, Fumio; Yamada, Muneki; and Hirata, Sadao, 4,500,677, Cl. 525-57.000.
Hiratani, Hajime: *See*—
Nakanishi, Koichiro; and Hiratani, Hajime, 4,500,514, Cl. 424-94.000.
Hirooka, Yasuhiro: *See*—
Komoda, Akira; Hirooka, Yasuhiro; Yoshihara, Takahisa; and Matsuda, Akira, 4,500,400, Cl. 204-206.000.
Hirosawa, Yoshiaki: *See*—
Katayama, Hiroomi; Hirosawa, Yoshiaki; and Fujii, Masahiko, 4,499,875, Cl. 123-416.000.
Hitachi Cable, Ltd.: *See*—
Kajioka, Hiroshi; Tokunaga, Toshihide; and Nakagawa, Junkichi, 4,500,168, Cl. 350-96.340.
Hitachi Engineering Kabushiki Kaisha: *See*—
Koshio, Yoshihiro; Kato, Tadao; and Kawano, Hikaru, 4,500,002, Cl. 209-534.000.
Hitachi Koki Haramachi Works, Ltd.: *See*—
Takeda, Mutsumi, 4,499,804, Cl. 83-399.000.
Hitachi, Ltd.: *See*—
Hanma, Kentaro; Murakami, Toshio; and Todaka, Yoshihiro, 4,500,925, Cl. 358-227.000.
Koike, Norio; Tsukada, Toshihisa; Baji, Toru; and Sasano, Akira, 4,500,915, Cl. 358-44.000.
Kubo, Kanji; Momose, Tsugio; and Izumi, Chikahiko, 4,500,959, Cl. 364-200.000.
Kuroda, Shigeaki; Senshu, Takao; Oguni, Kensaku; Mochizuki, Taketoshi; Yasuda, Hiromu; Ishibane, Kyuhei; Atsumi, Akira; Kimura, Hideyuki; and Hatada, Toshio, 4,500,035, Cl. 236-92.00B.
Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,500,998, Cl. 372-61.000.
Miki, Masayuki; Suzuki, Seikou; and Sasayama, Takao, 4,499,880, Cl. 123-489.000.
Nihei, Mitsuo; and Nishi, Hidetoshi, 4,499,748, Cl. 72-238.000.
Nishiguchi, Akira; Usui, Sanpei; Oouchi, Tomihisa; and Iwai, Kazumi, 4,499,859, Cl. 122-18.000.
Noto, Yasuo; Naito, Shotaro; and Ohmae, Tsutomu, 4,500,820, Cl. 318-139.000.
Onuki, Jin; Soeno, Ko; Morita, Keiichi; and Onodera, Hisakithi, 4,500,904, Cl. 357-67.000.
Sato, Tetsuo; and Kominami, Yasuo, 4,500,932, Cl. 360-65.000.
Shimizu, Isao, 4,500,900, Cl. 357-36.000.
Sugimoto, Norihiko; Hamada, Nobuhiro; Masuda, Ikuro; and Sakurai, Jinichi, 4,500,951, Cl. 364-186.000.
Takatori, Hiroshi; and Suzuki, Toshiro, 4,500,999, Cl. 375-16.000.
Tanaka, Yoshito; Ichiryu, Ken; and Iwata, Naohiko, 4,500,865, Cl. 338-13.000.
Tsuboi, Nobuyoshi; Shima, Seiya; Kanasaki, Morio; and Nakazawa, Hayashi, 4,499,986, Cl. 198-322.000.
Tsuchiya, Masatoshi; Soeno, Ko; and Yoshida, Tomomasa, 4,499,774, Cl. 73-727.000.
Yatsuo, Tsutomu; Nagano, Takahiro; Oikawa, Saburo; and Horie, Akira, 4,500,903, Cl. 357-38.000.
Yuhara, Akitsuna; Hosaka, Norio; Fujita, Yuji; Kishimoto, Kiyoharu; and Yamada, Jun, 4,500,807, Cl. 310-313.00B.
Hobart, James L.: *See*—
Sasnett, Michael W.; Hobart, James L.; and Gibson, Larry A., 4,500,996, Cl. 372-19.000.
Hochstein, Peter A.; and Shih, Kelvin. Electrical timing control switch. 4,500,795, Cl. 307-141.000.
Hoechst Aktiengesellschaft: *See*—
Diery, Helmut; and Mees, Bernhard, 4,500,735, Cl. 564-286.000.
Seipke, Gerhard; Tripier, Dominique; and Johnscher, Gerd, 4,500,450, Cl. 260-112.00R.
Thoese, Klaus, 4,500,598, Cl. 428-331.000.
Hoefelmayr, Tilman; and Maier, Jakob, to Biomelktechnik Hoefelmayr & Co. Apparatus for conveying milk using an underpressure. 4,499,854, Cl. 119-14.320.
Hoffman, Wolfgang, to B & H Manufacturing Company, Inc. Container feed for labeling machine. 4,500,386, Cl. 156-449.000.
Hoffmann-La Roche Inc.: *See*—
Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, 4,500,462, Cl. 260-405.500.
Hamilton, James G.; Sullivan, Ann C.; Tobias, Lawrence D.; and Triscari, Joseph, 4,500,540, Cl. 514-397.000.
Hohmann, Eugen: *See*—
Wohlgemuth, Juergen; and Hohmann, Eugen, 4,499,906, Cl. 128-776.000.
Holland, George W.: *See*—
Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, 4,500,462, Cl. 260-405.500.
Hollmann, Bernd, to Claas Ohg. Method of baling, and baling press. 4,499,714, Cl. 56-341.000.
Holmberg, Gote: *See*—
Elwing, Ben; Foldi, Peter; and Holmberg, Gote, 4,499,824, Cl. 100-48.000.
Holset Engineering Company Limited: *See*—
Szczupak, David T.; Walsham, Brian E.; Hooley, Desmond J.; Flaxington, David; McKean, Peter S.; and Wescott, John D., 4,499,732, Cl. 60-602.000.
Holzschuh, Johannes: *See*—
Cyriax, Wilhelm; Tamboers, Gerhard; and Holzschuh, Johannes, 4,500,274, Cl. 425-185.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Aoki, Masanori, 4,500,101, Cl. 280-152.100.
Furukawa, Nobuyuki; and Sanbe, Mitsuhiro, 4,500,478, Cl. 261-52.000.
Ikenoya, Yasuo; Ueda, Shuso; and Araki, Masafumi, 4,499,724, Cl. 60-290.000.
Katayama, Hiroomi; Hirosawa, Yoshiaki; and Fujii, Masahiko, 4,499,875, Cl. 123-416.000.
Zaita, Katsuyuki; and Tahata, Michio, 4,500,477, Cl. 261-44.00B.
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, to Chugai Seiyaku Kabushiki Kaisha. 3-Substituted-ureido-N-pyridyl benzamides. 4,500,714, Cl. 546-309.000.
Honda, Naoto: *See*—
Sawa, Buntaro; and Honda, Naoto, 4,500,851, Cl. 331-2.000.

Honeywell Inc.: *See—*
Nishimoto, Ikuo, 4,500,797, Cl. 307-296.00R.
Vollmer, Rudolf, 4,500,036, Cl. 236-68.00B.
Honjo, Kazumi, to Niles Parts Company, Limited. Car cigar lighter. 4,500,774, Cl. 219-265.000.
Honodel, Charles A., to United States of America, Energy. Barrier breaching device. 4,499,828, Cl. 102-301.000.
Hood, Charles F.: *See—*
Fathauer, George H.; and Hood, Charles F., 4,499,766, Cl. 73-304.00C.
Fathauer, George H.; Hood, Charles F.; and Runck, Robin B., 4,499,767, Cl. 73-304.00C.
Hooley, Desmond J.: *See—*
Szczupak, David T.; Walsham, Brian E.; Hooley, Desmond J.; Flaxington, David; McKean, Peter S.; and Wescott, John D., 4,499,732, Cl. 60-602.000.
Hori, Yutaka; Sunakawa, Makoto; Takayama, Kikuo; Matsuoka, Naoki; and Moroishi, Yutaka, to Nitto Electric Industrial Co., Ltd. Pressure-sensitive adhesive composition. 4,500,683, Cl. 524-533.000.
Horie, Akira: *See—*
Yatsuo, Tsutomu; Nagano, Takahiro; Oikawa, Saburo; and Horie, Akira, 4,500,903, Cl. 357-38.000.
Horie, Seiji; Nakano, Junji; Nagata, Masayoshi; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive printing materials. 4,500,622, Cl. 430-78.000.
Horie, Yoshihiro: *See—*
Hanamoto, Hiroyuki; and Horie, Yoshihiro, 4,500,957, Cl. 364-200.000.
Horn, Heinz: *See—*
Gerber, Heinz; Adam, Klaus; and Horn, Heinz, 4,499,750, Cl. 72-351.000.
Hortlik, Frantisek: *See—*
Junek, Jan; Skarka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Hacova, Kveta; Vobornik, Vaclav; Ohlidal, Vladimi; and Lihtarova, Ludmila, 4,499,718, Cl. 57-301.000.
Hosaka, Norio: *See—*
Yuhara, Akitsuna; Hosaka, Norio; Fujita, Yuji; Kishimoto, Kiyoharu; and Yamada, Jun, 4,500,807, Cl. 310-313.00B.
Hosaka, Tomiharu: *See—*
Hotta, Shu; Hosaka, Tomiharu; and Shimotsuma, Wataru, 4,500,459, Cl. 260-396.00N.
Hoshida, Robert A.: *See—*
Madden, Allan C.; Cellucci, Robert; Hoshida, Robert A.; and MacKay, Duncan, 4,499,768, Cl. 73-462.000.
Hosokawa, Tomoyoshi; Matsuura, Ikutoshi; Takahashi, Hidenori; Ando, Kunio; and Tamura, Gakuzo, to Chugai Seiyaku Kabushiki Kaisha. Ascochlorin derivatives, and pharmaceutical composition containing the same. 4,500,544, Cl. 514-543.000.
Hosomizu, Tohru: *See—*
Ohno, Kenichi; Hosomizu, Tohru; and Ogawa, Rokutaro, 4,500,906, Cl. 357-71.000.
Hosono, Nagao, to Canon Kabushiki Kaisha. Image forming apparatus and a unit detachably used in the same. 4,500,195, Cl. 355-3.00R.
Hosonuma, Masashi: *See—*
Asano, Hisoshi; Shimamune, Takayuki; Goto, Toshiki; and Hosonuma, Masashi, 4,500,405, Cl. 204-290.00F.
Hotta, Seiko: *See—*
Sangu, Osamu; and Hotta, Seiko, 4,500,775, Cl. 219-497.000.
Hotta, Shu; Hosaka, Tomiharu; and Shimotsuma, Wataru, to Matsushita Electric Industrial Co., Ltd. Tetracyanoanthraquinodimethane compounds. 4,500,459, Cl. 260-396.00N.
House, David W., to UOP Inc. Hydrolysis of water-insoluble organic halides. 4,500,740, Cl. 568-796.000.
Howlett, James J.: *See—*
Zagranski, Raymond D.; Howlett, James J.; and Lappos, Nicholas D., 4,500,966, Cl. 364-432.000.
Hoyt, Robert M.; Bobbitt, Donald E.; Bartee, Gary E.; Garton, Stanley C.; and Pilliard, J. Paul, to A. B. Chance Company. Method and apparatus for anchoring retaining walls and the like, and installation therefor. 4,499,698, Cl. 52-157.000.
Hozumi, Kazuhiro: *See—*
Tsuchiya, Tatsuo; and Hozumi, Kazuhiro, 4,500,075, Cl. 267-8.00R.
Hrachovcova, Maria: *See—*
Durmis, Julius; Balogh, Alojz; Karvas, Milan; Hrachovcova, Maria; Masek, Jan; Caucik, Pavol; and Povazancova, Marta, 4,500,446, Cl. 252-403.000.
Hsieh, Hsin H.: *See—*
Cook, Frank T.; Nutt, Michael O.; and Hsieh, Hsin H., 4,500,717, Cl. 548-229.000.
Huang, Timothy D., to DAI-E Systems, Inc. Method for encoding Chinese characters. 4,500,872, Cl. 340-365.00R.
Huang, Tracy J.: *See—*
Chen, Nai Y.; Haag, Werner O.; Huang, Tracy J.; and Wong, Stephen S., 4,500,417, Cl. 208-111.000.
Huber, Johann; and Thanner, Otto, to Tyrolit Schleifmittelworke Swarovski K.G. Abrasive article. 4,500,325, Cl. 51-298.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., to Chevron Research Company. Recovering metals from spent hydroprocessing catalysts. 4,500,495, Cl. 423-53.000.
Huffnagle, Clifton W.; and Morningstar, LeRoy J., to AMP Incorporated. Mounting and grounding clamp for shielded cable. 4,500,157, Cl. 339-97.00R.
Hugelshofer, Paul; Bruttel, Beat; Pfenninger, Heinz; and Lacroix, Roger, to Ciba-Geigy Corporation. Process for the preparation of concentrated fluid dye compositions. 4,500,321, Cl. 8-527.000.
Hughes Aircraft Company: *See—*
Gagnon, Ralph J.; and Cedarstrom, Roy A., 4,500,172, Cl. 350-331.00R.
Jensen, William E., 4,501,007, Cl. 377-60.000.
Lewyn, Lanny L.; and Lucas, Charles H., 4,500,846, Cl. 330-253.000.
Hughes Tool Company: *See—*
Watkins, Bruce J., 4,499,950, Cl. 166-285.000.
Hull, Frederick H., to Budd Company, The. Road simulator testing automotive and truck wheels and hubs. 4,499,759, Cl. 73-146.000.
Hunt, Arlon J.; Hansen, Leif J.; and Evans, David B., to United States of America, Energy. Solar heat receiver. 4,499,893, Cl. 126-449.000.
Huret et ses Fils: *See—*
Crepin, Herve , 4,500,302, Cl. 474-82.000.
Hurst, Fred J., Jr., to United States of America, Energy. Reductive stripping process for uranium recovery from organic extracts. 4,500,493, Cl. 423-10.000.
Husband, Fiona M.: *See—*
Rowley, Alan G.; and Husband, Fiona M., 4,500,497, Cl. 423-89.000.
Hussey, Ian G., to Environmental Equipment Corporation. Wayside wheelchair lift. 4,499,970, Cl. 187-9.00R.
Husson, Alan L.: *See—*
Nguyen, Tac H.; and Husson, Alan L., 4,499,974, Cl. 187-29.00R.
Hutchinson, Franklin D.: *See—*
Schmidt, William P.; and Hutchinson, Franklin D., 4,500,063, Cl. 248-475.100.
Huther, Werner, to Motoren-Und Turbinen-Union Munchen GmbH. Method of manufacture silicon nitride ceramic molded articles. 4,500,482, Cl. 264-65.000.
Hutson, Thomas, Jr., to Phillips Petroleum Company. Catalytic alkylation of hydrocarbons. 4,500,490, Cl. 422-62.000.
Hwang, Mau-Choung P.: *See—*
Duvall, William E.; and Hwang, Mau-Choung P., 4,500,923, Cl. 358-190.000.
Hyohdou, Masato: *See—*
Kato, Yukihiro; Kawahara, Hideo; and Hyohdou, Masato, 4,500,567, Cl. 427-255.300.
Ibuki, Yasuhiro: *See—*
Hasegawa, Katsuji; and Ibuki, Yasuhiro, 4,499,935, Cl. 144-209.00R.
Icaro Olivieri & C. S.p.A.: *See—*
Olivieri, Icaro, 4,499,674, Cl. 36-117.000.
Ichijima, Seigi: *See—*
Sakanoue, Kei; Yagihara, Morio; Ichijima, Seigi; and Nagao, Kimitoshi, 4,500,634, Cl. 430-544.000.
Ichiryu, Ken: *See—*
Tanaka, Yoshito; Ichiryu, Ken; and Iwata, Naohiko, 4,500,865, Cl. 338-13.000.
Idel, Karsten: *See—*
Ostlinning, Edgar; and Idel, Karsten, 4,500,702, Cl. 528-388.000.
Igashira, Toshihiko; Tanaka, Taro; and Sakakibara, Yasuyuki, to Nippon Soken, Inc. Fuel injection system for an internal combustion engine. 4,499,878, Cl. 123-478.000.
Iida, Hideyo: *See—*
Hayashi, Yutaka; Yamanaka, Mithuyuki; Iida, Hideyo; Shiba, Nobuyasu; Karasawa, Hideyuki; Mishuku, Toshio; and Itou, Atsuo, 4,500,743, Cl. 136-258.000.
Iijima, Hitoshi: *See—*
Matsuoka, Fumio; Iijima, Hitoshi; Yamazaki, Kisuke; Kasagi, Hiroshi; Nakashima, Yasuo; Sakuma, Kiyoshi; and Umehara, Mitsuo, 4,499,739, Cl. 62-212.000.
Ikari, Shinichi: *See—*
Shima, Toshiaki; Hamamuro, Naozi; Ikari, Shinichi; and Fuzishiro, Tuneo, 4,499,929, Cl. 141-1.100.
Ikeda, Satoshi: *See—*
Takeuchi, Hideo; Kaneko, Toshihisa; and Ikeda, Satoshi, 4,499,827, Cl. 101-425.000.
Ikekawa, Nobuo: *See—*
DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, 4,500,460, Cl. 260-397.200.
Ikenoya, Yasuo; Ueda, Shuso; and Araki, Masafumi, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas cleaning device for internal combustion engine of motorcycle. 4,499,724, Cl. 60-290.000.
Ikutake, Hiroshi, to Nippon Piston Ring Co., Ltd. Process for manufacturing a piston ring. 4,499,643, Cl. 29-156.600.
Illinois Tool Works Inc.: *See—*
Pliml, Frank V., Jr., 4,500,237, Cl. 411-11.000.
Imae, Kiyoto; Aburaki, Shimpei; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, to Bristol-Myers Company. Cephalosporin derivatives. 4,500,526, Cl. 514-226.000.
Imaizumi, Atsushi: *See—*
Suzuki, Yoji; Imaizumi, Atsushi; Yamaguchi, Hisao; Kanesaki, Masaharu; and Ono, Shoji, 4,500,639, Cl. 435-244.000.
Immink, Kornelis A.; Nijboer, Jakob G.; Ogawa, Hiroshi; and Odaka, Kentaro, to Sony Corporation. Method of coding binary data. 4,501,000, Cl. 375-25.000.
Inai, Yuichi: *See—*
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Inai, Yuichi; Kohara, Yoshiyuki; Kawakami, Yoshiyuki; and Tsurugi, Tomio, 4,500,463, Cl. 260-406.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Demonte, Flippo; and Figini, Mario, 4,500,216, Cl. 400-8.000.
Ingram, Gary L., to Spencer Wright Industries, Inc. Tufting machines. 4,499,835, Cl. 112-79.00R.

Inland Steel Company: *See*—
Kim, Yong-Wu; Coduti, Phillip L.; Sok, Brian A.; and Carter, William A., 4,500,561, Cl. 427-25.000.
Inmos Corporation: *See*—
Sud, Rahul; and Hardee, Kim C., 4,500,799, Cl. 307-449.000.
Inoue, Takashi: *See*—
Fuchikami, Jun; Higashi, Hidehiro; Inoue, Takashi; and Oba, Hiroyuki, 4,500,645, Cl. 502-65.000.
Inoue, Tokuta: *See*—
Kanda, Mutsumi; Nakanishi, Kiyoshi; Inoue, Tokuta; and Nakajima, Mikio, 4,499,868, Cl. 123-188.00M.
Insinger, Richard H., III; and Rodemann, Alfred H., to United States of America, Navy. Personal alpha contamination simulator and detector. 4,500,295, Cl. 434-218.000.
Institut Francais du Petrole: *See*—
Chevalier, Andre , 4,500,155, Cl. 339-94.00M.
Institut Organicheskogo Sinteza Akademii Nauk Latviiskoi SSR: *See*—
Grinberg, Grigory M.; Akifiev, Oleg N.; Pytel, Jury A.; Gilev, Anatoly P.; and Paberza, Monika Y., 4,500,516, Cl. 424-156.000.
Institut Pasteur: *See*—
Barme, Michel, 4,500,512, Cl. 424-89.000.
International Business Machines Corporation: *See*—
Binnig, Gerd K.; and Gerber, Christoph E., 4,499,737, Cl. 62-56.000.
Bretscher, Erwin; and Vettiger, Peter, 4,500,790, Cl. 250-492.200.
Bucek, Francis J.; and Paxhia, Frank V., 4,500,928, Cl. 358-296.000.
Cases, Moises; Kraft, Wayne R.; Stahl, William L., Jr.; and Thoma, Nandor G., 4,500,800, Cl. 307-468.000.
Chang, Ifay F., 4,500,955, Cl. 364-200.000.
Daniels, Raymond A., 4,500,198, Cl. 355-14.00D.
Duke, Alan H.; Hartung, Michael H.; Marschner, Frederick J.; and Nolan, Kenneth P., 4,500,954, Cl. 364-200.000.
Elander, Robert C.; Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Shuck, Robert E.; and Tuchman, Walter L., 4,500,750, Cl. 178-22.080.
Galwey, Ronald K.; and Kanazawa, Kay K., 4,500,840, Cl. 324-425.000.
Heller, Andrew R.; and Worley, William S., Jr., 4,500,952, Cl. 364-200.000.
Lipschutz, Lewis D., 4,500,945, Cl. 361-386.000.
Nickle, Allen F., 4,500,964, Cl. 364-300.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., 4,500,448, Cl. 252-522.00R.
International Paper Company: *See*—
Nowacki, Ulrich G., 4,500,306, Cl. 493-92.000.
International Power Technology, Inc.: *See*—
Cheng, Dah Y., 4,499,721, Cl. 60-39.050.
International Standard Electric Corporation: *See*—
Oswald, Thomas, 4,501,022, Cl. 455-601.000.
International Telecommunications Satellite Organization: *See*—
Shimbo, Osamu; Nguyen, Lan N.; and Dicks, Jack L., 4,500,984, Cl. 370-6.000.
International Telephone and Telegraph Corporation: *See*—
Turbak, Albin F.; Snyder, Fred W.; and Sandberg, Karen R., 4,500,546, Cl. 514-781.000.
Interpace Corporation: *See*—
Miggins, Michael R., 4,500,745, Cl. 174-31.00R.
Invacare Corporation: *See*—
Haury, Gilbert E.; Patel, Nathalal G.; Lockard, Walter G.; and Wiatrak, Thomas R., 4,500,102, Cl. 280-242.0WC.
IPCO Corporation: *See*—
Friedman, Abraham, 4,500,296, Cl. 433-225.000.
Irving, Edward; and Smith, Terence J., to Ciba-Geigy Corporation. Method of forming images from liquid masses. 4,500,629, Cl. 430-325.000.
Irwin, Robert S.; and Logullo, Francis M., Sr., to Du Pont de Nemours, E. I., and Company. Optically anisotropic melt forming copolyesters. 4,500,699, Cl. 528-128.000.
Ishibane, Kyuhei: *See*—
Kuroda, Shigeaki; Senshu, Takao; Oguni, Kensaku; Mochizuki, Taketoshi; Yasuda, Hiromu; Ishibane, Kyuhei; Atsumi, Akira; Kimura, Hideyuki; and Hatada, Toshio, 4,500,035, Cl. 236-92.00B.
Ishida, Hideaki, to Casio Computer Co., Ltd. Key data entry system for an electronic musical instrument. 4,499,807, Cl. 84-1.030.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; Nakano, Eiichi; and Ishidoshiro, Hirosh. 4,500,318, Cl. 8-111.000.
Ishii, Kiyoshi; Murai, Masataka; and Yonekawa, Hitoshi, to Daicel Chemical Industries, Ltd. Semipermeable membrane elements. 4,500,426, Cl. 210-321.300.
Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 4,500,133, Cl. 297-131.000.
Ishikawa, Hitoshi: *See*—
Yamamoto, Kimihiko; and Ishikawa, Hitoshi, 4,499,837, Cl. 112-158.00A.
Ishikawa, Sakae: *See*—
Akano, Shinichi; Goto, Tsutomu; Watanabe, Hiroshi; Kuroda, Masato; Ishikawa, Sakae; and Matsumoto, Ryoichiro, 4,499,754, Cl. 73-861.120.
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, to Copyer Kabushiki Kaisha; and Canon Kabushiki Kaisha. Electrophotographic photosensitive member with oxadiazole containing disazo compound. 4,500,619, Cl. 430-59.000.
Ishitobi, Yoshimitsu; Fujii, Kouhei; and Nakatsuji, Fumio, to NEC Kansai, Ltd. Joystick controller using magnetosensitive elements with bias magnets. 4,500,867, Cl. 338-128.000.
Iskra, Michael J.: *See*—
Pieniak, Heinz A.; and Iskra, Michael J., 4,500,315, Cl. 604-379.000.
Isogai, Kiyoshi: *See*—
Kitagawa, Katsutoshi; Isogai, Kiyoshi; Ohmori, Nobuo; Takita, Naka; Okamoto, Makoto; Koga, Itsuo; and Ito, Kazuo, 4,500,099, Cl. 277-228.000.
Isoya, Yukinori: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,500,476, Cl. 261-44.00C.
Itaya, Masahiko: *See*—
Haneda, Satoshi; Itaya, Masahiko; and Tanaka, Minoru, 4,500,616, Cl. 430-45.000.
Itek Corporation: *See*—
Smyth, Bruce E., 4,500,202, Cl. 356-237.000.
Ito, Kazuo: *See*—
Kitagawa, Katsutoshi; Isogai, Kiyoshi; Ohmori, Nobuo; Takita, Naka; Okamoto, Makoto; Koga, Itsuo; and Ito, Kazuo, 4,500,099, Cl. 277-228.000.
Itoh, Hayami: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Itoh, Hayami; Tatsumi, Shuhei; and Takao, Shoichi, 4,500,041, Cl. 241-16.000.
Itoh, Isamu: *See*—
Ohmura, Kunioki; Torigoe, Masaaki; Itoh, Isamu; and Hayashi, Katsumi, 4,500,632, Cl. 430-428.000.
Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; and Karino, Yukio, 4,500,636, Cl. 430-566.000.
Itoh, Isao: *See*—
Yazaki, Takao; Hattori, Kazuhide; Hattori, Satoru; Hayama, Kazuhide; and Itoh, Isao, 4,500,597, Cl. 428-317.700.
Itoh, Takaaki: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,500,476, Cl. 261-44.00C.
Itou, Atsuo: *See*—
Hayashi, Yutaka; Yamanaka, Mithuyuki; Iida, Hideyo; Shiba, Nobuyasu; Karasawa, Hideyuki; Mishuku, Toshio; and Itou, Atsuo, 4,500,743, Cl. 136-258.000.
Ivani, Edward J. Silicone-vinyl acetate composition for contact lenses. 4,500,695, Cl. 526-279.000.
Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Wafer exposure method and apparatus. 4,500,615, Cl. 430-30.000.
Iwai, Kazumi: *See*—
Nishiguchi, Akira; Usui, Sanpei; Oouchi, Tomihisa; and Iwai, Kazumi, 4,499,859, Cl. 122-18.000.
Iwata, Naohiko: *See*—
Tanaka, Yoshito; Ichiryu, Ken; and Iwata, Naohiko, 4,500,865, Cl. 338-13.000.
Iwata, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control device for an internal combustion engine. 4,499,877, Cl. 123-425.000.
Izume, Masayuki, to Taiyo Ltd. Rotary business form printing press. 4,500,082, Cl. 270-20.100.
Izumi, Asashiro, to Kabushiki Kaisha Ishida Koko Seisakusho. Removable hopper mechanism in an automatic weighing apparatus. 4,499,962, Cl. 177-58.000.
Izumi, Chikahiko: *See*—
Kubo, Kanji; Momose, Tsugio; and Izumi, Chikahiko, 4,500,959, Cl. 364-200.000.
Izumi, Hiroshi, to Alps Electric Co., Ltd. Ceramic trimmer capacitor. 4,500,941, Cl. 361-293.000.
J. I. Case Company: *See*—
Maurer, Herman J.; Pedersen, Carl O.; and Nudd, Barry C., 4,500,250, Cl. 414-695.500.
Tucek, Frank J., 4,500,139, Cl. 305-10.000.
Jackson, Ernest V.: *See*—
Martin, Alan B.; and Jackson, Ernest V., 4,499,946, Cl. 166-57.000.
Jacobi, Stephen F.; Haight, Robert E.; Schletzbaum, John W.; Martin, Yolanda E.; and Lang, Stephen P., to Deere & Company. Filter monitoring system. 4,500,874, Cl. 340-607.000.
Jacobson, Albin K.; Rychnovsky, Raymond E.; and Visbeck, Cornelius N., to United States of America, Energy. Explosively separable casing. 4,499,829, Cl. 102-378.000.
Jacobson, Mark K.; and Belttari, Stanley C., to Boremaster Precision Tool & Mfg. Boring bar. 4,500,232, Cl. 408-153.000.
Jacobson, Robert G., to Zehntel, Inc. In-circuit digital tester for testing microprocessor boards. 4,500,993, Cl. 371-16.000.
Jagtap, Ashvinkumar N.: *See*—
Woods, John H.; Graves, Toby R.; Nasser, William E.; and Jagtap, Ashvinkumar N., 4,500,359, Cl. 106-270.000.
Jahn, Randy K.; and Liepins, Raimond, to United States of America, Energy. Di-p-xylylene polymer and method for making the same. 4,500,562, Cl. 427-27.000.
Jaillet, Andre : *See*—
Desjobert, Gilles; and Jaillet, Andre , 4,499,707, Cl. 53-429.000.
Jalava, Jouko S.: *See*—
Kuisma, Heikki T.; Lehto, Ari; and Jalava, Jouko S., 4,500,940, Cl. 361-286.000.
Janisiewicz, Stanley W.; Hills, Maynard J.; and Lovell, Edward J., to Universal Instruments Corporation. Indexed feed of electronic component supply tubes. 4,500,246, Cl. 414-414.000.

Janssen, Alexander P. Disposable cooking bags. 4,499,817, Cl. 99-403.000.

Janutka, William J., to Eaton Corporation. Self-powered nonregenerative fast gate turn-off FET. 4,500,801, Cl. 307-570.000.

Janutka, William J., to Eaton Corporation. Three terminal bidirectional source to source FET circuit. 4,500,802, Cl. 307-571.000.

Japan Bano'k Co. Ltd.: *See*—
Furutsu, Akira, 4,499,928, Cl. 140-93.200.

Japan Chemical Research Co., Ltd.: *See*—
Nakanishi, Koichiro; and Hiratani, Hajime, 4,500,514, Cl. 424-94.000.

Japan Spectroscopic Co., Ltd.: *See*—
Watanabe, Shinichiro, 4,500,205, Cl. 356-325.000.

Jaquen, Claude: *See*—
Courtois, Guy; and Jaquen, Claude, 4,500,227, Cl. 405-128.000.

Jaros, Frantisek: *See*—
Junek, Jan; Skarka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Hacova, Kveta; Voborník, Vaclav; Ohlidal, Vladimi; and Lihtarova, Ludmila, 4,499,718, Cl. 57-301.000.

Jensen, William E., to Hughes Aircraft Company. CCD differentiator. 4,501,007, Cl. 377-60.000.

Jess, Thurman S., to Cormed, Inc. Integral tube-loading assembly for peristaltic pump. 4,500,269, Cl. 418-45.000.

Jevnikar, Mary G.; and Kuch, Philip L., to Standard Oil Company, The. Process for the production of hydrogen and carbonyl sulfide from hydrogen sulfide and carbon monoxide using a multi-metal oxide/sulfide catalyst. 4,500,505, Cl. 423-416.000.

Johansson, Lars. Self-adjusting boat trailer cradle. 4,500,249, Cl. 414-534.000.

John Fluke Mfg. Co., Inc.: *See*—
Meyer, Donald G., 4,500,854, Cl. 331-117.00R.

John, Heinz, deceased; and by John nee Ruffler, Friedlinde, heir, to Lindauer Dornier Gesellschaft mbH. Device for individually separating and aligning heddles for threading. 4,499,638, Cl. 28-207.000.

John nee Ruffler, Friedlinde, heir: *See*—
John, Heinz, deceased; and John nee Ruffler, Friedlinde, heir, 4,499,638, Cl. 28-207.000.

Johnscher, Gerd: *See*—
Seipke, Gerhard; Tripier, Dominique; and Johnscher, Gerd, 4,500,450, Cl. 260-112.00R.

Johnsen, Anders E. Coupling. 4,500,235, Cl. 408-238.000.

Johnson, Christopher P., III: *See*—
Shanklin, James R., Jr.; and Johnson, Christopher P., III, 4,500,529, Cl. 514-235.000.

Johnson, David D.: *See*—
Peters, Penn A.; Biller, Cleveland J.; and Johnson, David D., 4,500,004, Cl. 212-80.000.

Johnson, Dwight N., to Fillpro Products, Inc. Flush valve. 4,499,616, Cl. 4-393.000.

Johnson & Johnson Dental Products Company: *See*—
Kumar, Narayan G., 4,500,657, Cl. 523-116.000.

Johnson, Luvern C., III. Convertible ski device. 4,500,108, Cl. 280-614.000.

Johnson, Lyle: *See*—
Mattingly, William R., Jr.; Johnson, Lyle; and Maher, Tommy B., 4,500,153, Cl. 339-89.00M.

Johnson Matthey Public Limited Company: *See*—
Wyatt, Michael; Leach, Gary M.; and Gould, Ashley M., 4,500,650, Cl. 502-204.000.

Johnson, William H. Energy efficient curing and drying system. 4,499,911, Cl. 131-302.000.

Johnston, Loren B., Jr., to RCA Corporation. System for segmentally refreshing the stored electron gun drive voltages of a flat panel display device. 4,500,815, Cl. 315-366.000.

Jones, Arthur A., to Nautilus Sports/Medical Industries, Inc. Weight lifting lower back exercising machine. 4,500,089, Cl. 272-117.000.

Jones, David G.; and Kwon, Oh K. Method and apparatus for monitoring wear particles in a liquid medium. 4,500,839, Cl. 324-204.000.

Jones, Howard: *See*—
Loev, Bernard; Jones, Howard; and Shroff, James R., 4,500,528, Cl. 514-228.000.
Loev, Bernard; Jones, Howard; and Suh, John T., 4,500,532, Cl. 514-256.000.

Jones, William A. Picture. 4,500,571, Cl. 428-13.000.

Jong, Jang T. Mixing faucet. 4,499,918, Cl. 137-606.000.

Jorgensen, Knut: *See*—
Else, George E.; Millward, Cyril; Dixon, Ronald H. T.; and Jorgensen, Knut, 4,500,352, Cl. 75-130.00B.

Jost, John W.; and Gallup, Darrell L., to Union Oil Company of California. Inhibiting scale precipitation from high temperature brine. 4,500,434, Cl. 210-696.000.

Jow, Long J.: *See*—
Jow, Long S.; and Jow, Long J., 4,499,793, Cl. 74-866.000.

Jow, Long S.; and Jow, Long J., to Transtech Industrial Corporation. Automatic gear shifting device. 4,499,793, Cl. 74-866.000.

Joy Manufacturing Company: *See*—
McDonald, Robert C.; and Macartney, Derek L., 4,500,228, Cl. 406-61.000.

Jumpeter, Alex, to Midland-Ross Corporation. Automatic minimum differential pressure control for dryer cylinders. 4,499,668, Cl. 34-41.000.

Junek, Jan; Skarka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Hacova, Kveta; Voborzik, Vaclav; Ohlidal, Vladimi; and Lihtarova, Ludmila, to Vyzkumny ustav bavlnarsky. Apparatus for separating impurities from open-end spinning units. 4,499,718, Cl. 57-301.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Nagano, Tamio, 4,499,981, Cl. 192-106.200.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Fukuda, Masao, 4,499,961, Cl. 177-25.000.

Kabushiki Kaisha Ishida Koko Seisakusho: *See*—
Izumi, Asashiro, 4,499,962, Cl. 177-58.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Tanabe, Toshiyuki, 4,499,792, Cl. 74-825.000.

Kabushiki Kaisha Meidensha: *See*—
Kashiwagi, Yoshiyuki; and Suzuki, Tsutai, 4,500,383, Cl. 156-285.000.

Kabushiki Kaisha Morita Seisakusho: *See*—
Kaneko, Kazuyoshi; and Tamura, Jun, 4,500,114, Cl. 297-170.000.

Kabushiki Kaisha Nippon Coinco: *See*—
Sugimoto, Osamu; and Akagawa, Masaki, 4,499,982, Cl. 194-1.00N.

Kabushiki Kaisha Suwa Seikosha: *See*—
Akazawa, Hiroyuki, 4,500,023, Cl. 226-76.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Takahashi, Hideaki; Hayakawa, Kiyoharu; Kondo, Haruyoshi; and Takeuchi, Takashi, 4,500,412, Cl. 204-425.000.

Kaczur, Jerry J.; and Coleman, John E., to Olin Corporation. Production of high purity stable ferrate salts. 4,500,499, Cl. 423-139.000.

Kadison Laboratories, Inc.: *See*—
Kadison, Sylvan; and Scheiner, David, 4,500,552, Cl. 426-96.000.

Kadison, Sylvan; and Scheiner, David, to Kadison Laboratories, Inc. Gelatin dessert product. 4,500,552, Cl. 426-96.000.

Kaiser, Roman: *See*—
Lamparsky, Dietmar; and Kaiser, Roman, 4,500,729, Cl. 560-225.000.

Kajioka, Hiroshi; Tokunaga, Toshihide; and Nakagawa, Junkichi, to Hitachi Cable, Ltd. Single polarization optical fibers. 4,500,168, Cl. 350-96.340.

Kallok, Michael J.; and Bornzin, Gene A., to Medtronic, Inc. Energy limiting cardioversion lead. 4,499,907, Cl. 128-786.000.

Kamaishi, Tadami; and Kitagawa, Takao, to Toray Industries, Incorporated. Graphic arts film and method of preparing same. 4,500,587, Cl. 428-204.000.

Kamao, Mitsugu: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Itoh, Hayami; Tatsumi, Shuhei; and Takao, Shoichi, 4,500,041, Cl. 241-16.000.

Kamimura, Takaaki: *See*—
Nozaki, Hidetoshi; Kamimura, Takaaki; Hatayama, Tamothu; and Utagawa, Tadashi, 4,500,744, Cl. 136-258.000.

Kaminski, David C.; and Shea, Dennis W., to Dana Corporation. Actuator for roller clutch drive system. 4,499,980, Cl. 192-35.000.

Kamochi, Atsumi: *See*—
Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; and Kamochi, Atsumi, 4,500,346, Cl. 71-94.000.

Kan, Hsin-Kuo: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.

Kanasaki, Morio: *See*—
Tsuboi, Nobuyoshi; Shima, Seiya; Kanasaki, Morio; and Nakazawa, Hayashi, 4,499,986, Cl. 198-322.000.

Kanayama, Kenji; and Sugi, Hidekuni, to Nippondenso Co., Ltd. Three-phase flat coils. 4,500,806, Cl. 310-198.000.

Kanazawa, Kay K.: *See*—
Galwey, Ronald K.; and Kanazawa, Kay K., 4,500,840, Cl. 324-425.000.

Kanda, Mutsumi; Nakanishi, Kiyoshi; Inoue, Tokuta; and Nakajima, Mikio, to Toyota Jidosha Kabushiki Kaisha. Intake device of an internal combustion engine. 4,499,868, Cl. 123-188.00M.

Kando, Toru: *See*—
Morizumi, Masaaki; Kando, Toru; and Haraguchi, Keisuke, 4,500,184, Cl. 354-149.110.

Kaneko, Kazuyoshi; and Tamura, Jun, to Kabushiki Kaisha Morita Seisakusho. Dental treatment chair assembly. 4,500,134, Cl. 297-170.000.

Kaneko, Toshihisa: *See*—
Takeuchi, Hideo; Kaneko, Toshihisa; and Ikeda, Satoshi, 4,499,827, Cl. 101-425.000.

Kanesaki, Masaharu: *See*—
Suzuki, Yoji; Imaizumi, Atsushi; Yamaguchi, Hisao; Kanesaki, Masaharu; and Ono, Shoji, 4,500,639, Cl. 435-244.000.

Kanezuka, Toshiyuki: *See*—
Kigasawa, Kazuo; Ohtani, Hideaki; and Kanezuka, Toshiyuki, 4,500,511, Cl. 424-81.000.

Kano, Fumio: *See*—
Maruhashi, Yoshitsugu; Kano, Fumio; Yamada, Muneki; and Hirata, Sadao, 4,500,677, Cl. 525-57.000.

Kansas University Endowment Association, The: *See*—
Diederich, Dennis A.; Wiegmann, Thomas B.; and Pinnick, Robert V., 4,500,309, Cl. 604-5.000.

Kao Corporation: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Itoh, Hayami; Tatsumi, Shuhei; and Takao, Shoichi, 4,500,041, Cl. 241-16.000.

Kapich, Davorin D., to GA Technologies Inc. Shaft seal system. 4,500,093, Cl. 277-15.000.

Kaplan, Frank: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.;

Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.

Karas, Bradley R.; and Baumgartner, Charles E., to General Electric Company. Bubble pressure barrier and electrode composite. 4,500,566, Cl. 427-115.000.

Karasawa, Hideyuki: *See*—
Hayashi, Yutaka; Yamanaka, Mithuyuki; Iida, Hideyo; Shiba, Nobuyasu; Karasawa, Hideyuki; Mishuku, Toshio; and Itou, Atsuo, 4,500,743, Cl. 136-258.000.

Karazim, Michael P.; Okashima, Bob Y.; and Ashburn, John J., to General Electric Company. Jet pump beam bolt retainer cutter. 4,499,691, Cl. 51-241.00S.

Karino, Yukio: *See*—
Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; and Karino, Yukio, 4,500,636, Cl. 430-566.000.

Karl Lautenschlager KG, Mobelbeschlagfabrik: *See*—
Lautenschlager, Gerhard W., 4,499,631, Cl. 16-370.000.
Lautenschlager, Karl, Jr.; and Lautenschlager, Horst, 4,500,140, Cl. 308-3.800.

Karr, Gerald S.: *See*—
Smith, Jay, III; and Karr, Gerald S., 4,500,879, Cl. 340-739.000.

Kartridg Pak Company, The: *See*—
Bloome, James A.; Meeker, Rick A.; Whicker, Jerry T.; and Foreman, Frederick J., 4,499,624, Cl. 15-97.00R.

Karvas, Milan: *See*—
Durmis, Julius; Balogh, Alojz; Karvas, Milan; Hrachovcova, Maria; Masek, Jan; Caucik, Pavol; and Povazancova, Marta, 4,500,446, Cl. 252-403.000.

Kasagi, Hiroshi: *See*—
Matsuoka, Fumio; Iijima, Hitoshi; Yamazaki, Kisuke; Kasagi, Hiroshi; Nakashima, Yasuo; Sakuma, Kiyoshi; and Umehara, Mitsuo, 4,499,739, Cl. 62-212.000.

Kasagi, Takao: *See*—
Wakayama, Masao; Takemura, Makoto; and Kasagi, Takao, 4,500,360, Cl. 106-286.500.

Kasahara, Hiroshi, to Nissin Kogyo Kabushiki Kaisha. Automotive tandem type master cylinder. 4,499,730, Cl. 60-585.000.

Kashiwagi, Yoshiyuki; and Suzuki, Tsutai, to Kabushiki Kaisha Meidensha. Process for bonding copper or copper-chromium alloy to ceramics, and bonded articles of ceramics and copper or copper-chromium alloy. 4,500,383, Cl. 156-285.000.

Kass, Lawrence. Metachromatic dye sorption and fluorescent light emmisive means for differential determination of developmental stages of neutrophilic granulocytic cells and other leukocytes. 4,500,509, Cl. 424-3.000.

Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,499,619, Cl. 5-99.00A.

Kassai, Kenzou, to Kassai Kabushikikaisha. Baby bed. 4,499,619, Cl. 5-99.00A.

Kaste, Robert P., to United States of America, Army. Bank firing attachment including pivotal locking lugs. 4,499,811, Cl. 89-14.500.

Kasuga, Muneo; Shimizu, Akira; and Nishio, Tadashi, to Olympus Optical Co., Ltd. Electrophotographic apparatus comprising detection assembly for detecting record paper shortage. 4,500,199, Cl. 355-14.0CU.

Katagi, Takashi; and Mano, Seiji, to Mitsubishi Denki Kabushiki Kaisha. Antenna system. 4,500,882, Cl. 343-372.000.

Katagiri, Kazuharu: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,500,619, Cl. 430-59.000.

Katayama, Hiroomi; Hirosawa, Yoshiaki; and Fujii, Masahiko, to New Nippon Electric Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Control unit modifiable engine ignition control apparatus. 4,499,875, Cl. 123-416.000.

Kato, Hisatoyo, to Fuji Photo Film Co., Ltd. Noise erasing apparatus for stimulable phosphor sheet. 4,500,783, Cl. 250-327.200.

Kato, Tadao: *See*—
Koshio, Yoshihiro; Kato, Tadao; and Kawano, Hikaru, 4,500,002, Cl. 209-534.000.

Kato, Toranosuke: *See*—
Tokitsu, Naoki; Fujiwara, Toshitaka; Kato, Toranosuke; and Uno, Toshihiko, 4,500,868, Cl. 340-52.00F.

Kato, Yukihiro; Kawahara, Hideo; and Hyohdou, Masato, to Nippon Sheet Glass Co., Ltd. Method for forming tin oxide coating. 4,500,567, Cl. 427-255.300.

Katou, Takashi: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,500,476, Cl. 261-44.00C.

Katsen, Boris J.; Brinkworth, Robert T.; Kay, Daniel J.; and Riester, James A., to Graphic Controls Corp. Heat sensitive recording papers. 4,500,354, Cl. 106-21.000.

Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, to Kyowa Hakko Kogyo Co., Ltd. Plasmids. 4,500,640, Cl. 435-253.000.

Katz, Manfred: *See*—
Antal, Paul S.; and Katz, Manfred, 4,499,716, Cl. 57-234.000.

Kaufman, Benjamin J.; Liu, Christopher S.; and Sung, Rodney L., to Texaco Inc. Reaction products of glycidyl derivatized polyolefins and 5-aminotetrazoles and lubricating oils containing same. 4,500,440, Cl. 252-51.50A.

Kaufmann, Peter, to Aquarius fur Dichte Bauten AG. Hose-like seal device for concrete joints. 4,499,925, Cl. 138-125.000.

Kawagishi, Toshio: *See*—
Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, 4,500,630, Cl. 430-386.000.

Kawahara, Hideo: *See*—
Kato, Yukihiro; Kawahara, Hideo; and Hyohdou, Masato, 4,500,567, Cl. 427-255.300.

Kawakami, Yoshiyuki: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Inei, Yuichi; Kohara, Yoshiyuki; Kawakami, Yoshiyuki; and Tsurugi, Tomio, 4,500,463, Cl. 260-406.000.

Kawakubo, Yukio: *See*—
Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,500,998, Cl. 372-61.000.

Kawamata, Motoo: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,500,719, Cl. 548-522.000.

Kawamura, Akinori: *See*—
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.

Kawamura, Noriko: *See*—
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.

Kawano, Hikaru: *See*—
Koshio, Yoshihiro; Kato, Tadao; and Kawano, Hikaru, 4,500,002, Cl. 209-534.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Itoh, Hayami; Tatsumi, Shuhei; and Takao, Shoichi, 4,500,041, Cl. 241-16.000.

Kawasaki, Kanjiro: *See*—
Kubo, Keishi; Watanabe, Hideo; Takigawa, Nobuhiro; Hagiri, Minoru; and Kawasaki, Kanjiro, 4,500,896, Cl. 346-204.000.

Kawasaki, Mikio: *See*—
Sakamoto, Eiichi; Kawasaki, Mikio; Ono, Kouji; Fukuoji, Kakujulo; and Fujimori, Noboru, 4,500,631, Cl. 430-413.000.

Kawasaki Steel Corporation: *See*—
Komoda, Akira; Hirooka, Yasuhiro; Yoshihara, Takahisa; and Matsuda, Akira, 4,500,400, Cl. 204-206.000.

Kawazoe, Shunji: *See*—
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Sato, Akihiro, 4,500,682, Cl. 525-240.000.

Kay, Daniel J.: *See*—
Katsen, Boris J.; Brinkworth, Robert T.; Kay, Daniel J.; and Riester, James A., 4,500,354, Cl. 106-21.000.

Kech, Gunter: *See*—
Benz, Karl; and Kech, Gunter, 4,499,765, Cl. 73-290.00V.

Keeley, Charles: *See*—
Brecker, Lawrence R.; and Keeley, Charles, 4,500,665, Cl. 524-227.000.

Keglewitsch, Josef; and Stechschulte, Theodore J., to Marathon Electric Mfg. Corp. Electrical connector with sliding collar. 4,500,161, Cl. 339-242.000.

Keglewitsch, Josef; and Stechschulte, Theodore J., to Marathon Electric Manufacturing Corporation. Contact clip apparatus for blade-type contacts. 4,500,162, Cl. 339-252.00F.

Kehoe, Gary S.: *See*—
Puglia, Wayne J.; Kehoe, Gary S.; and Clark, K. Warren, 4,500,547, Cl. 426-3.000.

Keller, Werner: *See*—
Zaugg, Robert; and Keller, Werner, 4,500,018, Cl. 222-598.000.

Kellerhals, Hanspeter: *See*—
Allemann, Martin; and Kellerhals, Hanspeter, 4,500,782, Cl. 250-291.000.

Kelley, John E.: *See*—
Whetten, Nathan R.; and Kelley, John E., 4,500,785, Cl. 250-385.000.

Kelley, William J.; and Prince, Terry K., to Mattel, Inc. Toy cargo plane. 4,500,299, Cl. 446-230.000.

Kelly, Michael G., to American Hoechst Corporation. Multi-ring fluorinated carbamates with textile soil repellent activity. 4,500,438, Cl. 252-8.750.

Kelsey-Hayes Company: *See*—
Rozmus, Walter J.; and Dietrich, Jerry L., 4,500,009, Cl. 220-256.000.

Kemfast Textiles, Inc.: *See*—
Harris, Ronald R., 4,499,741, Cl. 66-171.000.

Kennedy, Alexander W.: *See*—
Gunn, Walter H.; and Kennedy, Alexander W., 4,500,610, Cl. 428-624.000.

Kensinger, Lex D.: *See*—
Brown, Christopher K.; Kensinger, Lex D.; Over, William R.; and Wion, Donald A., 4,499,648, Cl. 29-564.200.

Keramidas, Vassilis G.; and Lourenco, Jose A., to AT&T Bell Laboratories. LPE Growth on group III-V compound semiconductor substrates containing phosphorus. 4,500,367, Cl. 148-171.000.

Kervistin, Robert; Lardellier, Alain M. J.; Mazeaud, Georges; and Crozet, Francois E. G., to S.N.E.C.M.A. Means for controlling clearance in an intershaft bearing journal of a multi-spool gas turbine. 4,500,143, Cl. 384-467.000.

Khoshnevis, Behrokh. Incremental digitizer for encoding geometrical forms. 4,500,749, Cl. 178-18.000.

Kigasawa, Kazuo; Ohtani, Hideaki; and Kanezuka, Toshiyuki, to Grelan Pharmaceutical Co., Ltd. Antiinflammatory and analgesic gel. 4,500,511, Cl. 424-81.000.

Kijima, Shizumasa: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Inai, Yuichi; Kohara, Yoshiyuki; Kawakami, Yoshiyuki; and Tsurugi, Tomio, 4,500,463, Cl. 260-406.000.

Kilb, Donald A.; and Diercksmeier, Richard A., to E. D. Coddington Manufacturing Company. Split stations surface grinding apparatus. 4,499,690, Cl. 51-56.00R.

Killingaworth, Emmett D., to Westinghouse Electric Corp. Meter encoding register having improved zeroing mechanism. 4,500,779, Cl. 250-231.0SE.

Kim-Kee Enterprises: *See*—
Kincheloe, Dan, 4,500,135, Cl. 297-250.000.

Kim, Kyusik. Liquid fuel prevaporization and back burning induction jet oval thrust transition tail pipe. 4,500,052, Cl. 244-12.100.

Kim, Sang Do. Shoes sole for ventilation and shock absorption. 4,499,672, Cl. 36-3.00B.

Kim, Yong-Wu; Coduti, Phillip L.; Sok, Brian A.; and Carter, William A., to Inland Steel Company. Minimization of spangling on hot dip galvanized steel strip. 4,500,561, Cl. 427-25.000.

Kimberly-Clark Corporation: *See*—
Damico, Joyce A., 4,500,316, Cl. 604-389.000.

Kimberly-Clark Limited: *See*—
Ridgewell, Terence E.; and Vallis, Keith, 4,500,120, Cl. 292-19.000.

Kimura, Hideyuki: *See*—
Kuroda, Shigeaki; Senshu, Takao; Oguni, Kensaku; Mochizuki, Taketoshi; Yasuda, Hiromu; Ishibane, Kyuhei; Atsumi, Akira; Kimura, Hideyuki; and Hatada, Toshio, 4,500,035, Cl. 236-92.00B.

Kimura, Kazuyoshi, Toshi Kimura, heirs: *See*—
Suzuki, Akira; Shioya, Yasumi; Watanabe, Norio; and Kimura, Keiichi, deceased, 4,500,427, Cl. 210-608.000.

Kimura, Keiichi, deceased: *See*—
Suzuki, Akira; Shioya, Yasumi; Watanabe, Norio; and Kimura, Keiichi, deceased, 4,500,427, Cl. 210-608.000.

Kimura, Yoshio: *See*—
Taya, Akira; Narita, Kazuo; Asada, Masao; and Kimura, Yoshio, 4,500,443, Cl. 252-301.40P.

Kinast, Gunther, to Bayer Aktiengesellschaft. Intermediate products for the preparation of Z-cephalosporins. 4,500,716, Cl. 548-196.000.

Kincheloe, Dan, to Kim-Kee Enterprises. Baby car seat. 4,500,135, Cl. 297-250.000.

King, Christopher J. H., to Monsanto Company. Divided electrochemical cell assembly. 4,500,403, Cl. 204-255.000.

King, Homer F., to H. King & Associates, Ltd. Display and storage unit. 4,500,148, Cl. 312-312.000.

King, John J.; Sellers, Ralph F.; and Castonguay, Richard N., to Ciba-Geigy Corporation. Modified amine hardener systems. 4,500,582, Cl. 428-116.000.

Kinsinger, Richard E., to General Electric Company. Hybrid switching device employing liquid metal contact. 4,500,934, Cl. 361-3.000.

Kipp, Robert M.: *See*—
Ayers, Ray R.; and Kipp, Robert M., 4,500,117, Cl. 285-3.000.

Kirner, Wilhelm, to Siemens Aktiengesellschaft. Device for covering and cleaning the discharge openings of ink printing heads. 4,500,894, Cl. 346-140.00R.

Kirovsky, Efim I.: *See*—
Eschenko, Vladislav Y.; Musaev, Irsali K.; Talibdzhanov, Zakhidzhan S.; Leonov, Viktor A.; Bobrov, Anatoly D.; Kirovsky, Efim I.; Gritsenko, Vladimir A.; and Golovanov, Alexandr V., 4,500,282, Cl. 431-184.000.

Kiryu, Yuichi; and Sawada, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Multijoint manipulator. 4,500,251, Cl. 414-719.000.

Kish, Robert J.: *See*—
Fox, Albert D.; Kish, Robert J.; and Knight, Donn C., 4,500,074, Cl. 254-270.000.

Kishi, Norimasa; and Noso, Kazunori, to Nissan Motor Company, Limited. Speech recognition system for an automotive vehicle. 4,501,012, Cl. 381-43.000.

Kishimoto, Kiyoharu: *See*—
Yuhara, Akitsuna; Hosaka, Norio; Fujita, Yuji; Kishimoto, Kiyoharu; and Yamada, Jun, 4,500,807, Cl. 310-313.00B.

Kita, Nobuyuki; Matsumoto, Hiroshi; and Hagiwara, Hitoshi, to Fuji Photo Film Co., Ltd. Developer for light-sensitive lithographic printing plate precursor. 4,500,625, Cl. 430-149.000.

Kita, Yasushi; Moroi, Shirou; Sakanoue, Akira; and Nakano, Hisaji, to Central Glass Co., Ltd. Lubricant comprising a partially defluorinated graphite fluoride. 4,500,678, Cl. 252-58.000.

Kitagawa, Hironobu: *See*—
Kobayashi, Takuma; Kitagawa, Hironobu; and Kobayashi, Shigeo, 4,500,686, Cl. 525-408.000.

Kitagawa, Katsutoshi; Isogai, Kiyoshi; Ohmori, Nobuo; Takita, Naka; Okamoto, Makoto; Koga, Itsuo; and Ito, Kazuo, to Toyota Jidosha Kabushiki Kaisha; and Chuo Spring Co., Ltd. Elastic supporting and sealing member with thermal foaming strip. 4,500,099, Cl. 277-228.000.

Kitagawa, Takao: *See*—
Kamaishi, Tadami; and Kitagawa, Takao, 4,500,587, Cl. 428-204.000.

Kitagishi, Nozomu; and Tajima, Akira, to Canon Kabushiki Kaisha. Focusing device for a camera. 4,500,188, Cl. 354-406.000.

Kitahara, Makoto: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,500,619, Cl. 430-59.000.

Kitahara, Takahiro: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,500,694, Cl. 526-245.000.

Kitamura, Takanori; Matsumoto, Mitsuo; and Tamura, Masuhiko, to Kuraray Co., Ltd. Process for producing methyl lactate. 4,500,727, Cl. 560-179.000.

Kiyohara, Toyohiko, to Mitsubishi Denki Kabushiki Kaisha. Light triggered thyristor, including a light guide, whose parameters are related by an equation. 4,500,164, Cl. 350-96.100.

Klein, Ernst, to A&A Manufacturing Co., Inc. Cable carrier. 4,499,720, Cl. 59-78.100.

Klein, Gary G. High efficiency bicycle frame. 4,500,103, Cl. 280-281.00R.

Klein, Gary S., to Eaton Corporation. Flame retardent electrical cable. 4,500,748, Cl. 174-121.00A.

Kleinhans, William A., to Rockwell International Corporation. Electro-optic sensor for measuring angular orientation. 4,500,200, Cl. 356-152.000.

Klinner, Wilfred E., to National Research Development Corporation. Crop engaging apparatus and methods. 4,499,712, Cl. 56-16.400.

Klipfontein Organic Products Corporation Limited: *See*—
Morgan, David L., 4,500,506, Cl. 423-474.000.

Klockner-Humboldt-Deutz AG: *See*—
Klotmann, Fred; and Ramesohl, Hubert, 4,500,285, Cl. 432-103.000.

Klopfleisch, Kim A.: *See*—
Luebrecht, Donald; and Klopfleisch, Kim A., 4,499,971, Cl. 187-9.00R.

Klotmann, Fred; and Ramesohl, Hubert, to Klockner-Humboldt-Deutz AG. Arrangement for mounting a barrel ring on the casting of a rotary cylinder. 4,500,285, Cl. 432-103.000.

Knabe, Andreas: *See*—
Girodi, Erich; Bornowski, Gunter; Dejmek, Eberhard; Knabe, Andreas; Koch, Roland; Urbach, Bernd; and Weisselberg, Arnold, 4,500,764, Cl. 219-59.100.

Knepshield, William R.; Ogletree, David D.; and Sander, Nat, to KOI Associates. Surgical knife with controllably extendable blade and gauge therefor. 4,499,898, Cl. 128-305.000.

Knight, Donn C.: *See*—
Fox, Albert D.; Kish, Robert J.; and Knight, Donn C., 4,500,074, Cl. 254-270.000.

Knott, Joseph, to Siemens Aktiengesellschaft. Device for regenerating the carrier particles of a two-component developer consisting of carrier particles and toner. 4,500,194, Cl. 355-3.0DD.

Ko, Yu M.; and Cornick, Keith, to General Electric Company, p.l.c., The. Apparatus and method for locating the position of a fault occurring in an electric power transmission system with respect to a monitoring point. 4,500,834, Cl. 324-52.000.

Kobayashi, Hideki; and Hamada, Mitsuo, to Toray Silicone Company, Inc. Electrically conductive silicone rubber compositions. 4,500,447, Cl. 252-511.000.

Kobayashi, Seishichi: *See*—
Taira, Kazuo; Morofuji, Akihiko; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,500,575, Cl. 428-35.000.

Kobayashi, Shigeo: *See*—
Kobayashi, Takuma; Kitagawa, Hironobu; and Kobayashi, Shigeo, 4,500,686, Cl. 525-408.000.

Kobayashi, Takuma; Kitagawa, Hironobu; and Kobayashi, Shigeo, to Toyo Boseki Kabushiki Kaisha. Polyester type block copolymer composition. 4,500,686, Cl. 525-408.000.

Kobayashi, Yoshiro: *See*—
DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, 4,500,460, Cl. 260-397.200.

Koch, Roland: *See*—
Girodi, Erich; Bornowski, Gunter; Dejmek, Eberhard; Knabe, Andreas; Koch, Roland; Urbach, Bernd; and Weisselberg, Arnold, 4,500,764, Cl. 219-59.100.

Kochendorfer, Heinrich: *See*—
Backe, Egbert; Muller, Rolf; Otto, Dieter; Leonardi, Cornelio; Kochendorfer, Heinrich; Fussner, Paul; Walker, Ewald; and Rommel, Rudi, 4,499,757, Cl. 73-119.00A.

Koga, Itsuo: *See*—
Kitagawa, Katsutoshi; Isogai, Kiyoshi; Ohmori, Nobuo; Takita, Naka; Okamoto, Makoto; Koga, Itsuo; and Ito, Kazuo, 4,500,099, Cl. 277-228.000.

Koga, Nobuhito: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,500,719, Cl. 548-522.000.

Kogo, Yasuo: *See*—
Minamisawa, Tsuyoshi; Kogo, Yasuo; and Nagata, Yasuhisa, 4,500,660, Cl. 523-428.000.

Kogyo Gijutsuin: *See*—
Hayashi, Yutaka; Yamanaka, Mithuyuki; Iida, Hideyo; Shiba, Nobuyasu; Karasawa, Hideyuki; Mishuku, Toshio; and Itou, Atsuo, 4,500,743, Cl. 136-258.000.

Kohama, Tokio: *See*—
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Nogami, Susumu; and Suzuki, Yukio, 4,499,882, Cl. 123-492.000.

Kohara, Yoshiyuki: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Inai, Yuichi; Kohara, Yoshiyuki; Kawakami, Yoshiyuki; and Tsurugi, Tomio, 4,500,463, Cl. 260-406.000.

Kohler, Robert D.: *See*—
Steffan, Leonard D.; and Kohler, Robert D., 4,499,920, Cl. 137-624.150.

Kohn, Erhard, to Telefunken Electronic GmbH. Method of manufacturing a field-effect transistor. 4,499,651, Cl. 29-571.000.

KOI Associates: *See*—
Knepshield, William R.; Ogletree, David D.; and Sander, Nat, 4,499,898, Cl. 128-305.000.

Koike, Kengo: *See*—
Yoshida, Hiroshi; Koike, Kengo; Shimano, Shizuo; Nakagawa, Taizo; and Ohmori, Kaoru, 4,500,536, Cl. 514-397.000.

Koike, Norio; Tsukada, Toshihisa; Baji, Toru; and Sasano, Akira, to Hitachi, Ltd. Color solid-state imager. 4,500,915, Cl. 358-44.000.

Koike, Shunji. Pocket for garments. 4,499,612, Cl. 2-250.000.

Koizumi, Masuo: *See*—
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.

Kojima, Shigezo: *See*—
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Tsuyama, Setsuya; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,499,639, Cl. 28-282.000.

Kokai, Katsuaki; and Ohta, Takeo, to Nippon Steel Corporation. Process for producing a grain-oriented electromagnetic steel strip or sheet. 4,500,366, Cl. 148-111.000.

Kollmorgen Technologies Corporation: *See*—
Lassen, Charles L., 4,500,389, Cl. 156-643.000.

Komagata, Hideki: *See*—
Mitomi, Takeshi; Yoshimura, Eiji; and Komagata, Hideki, 4,500,581, Cl. 428-85.000.

Komakine, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Heat exchangers installed in fluidized beds. 4,499,944, Cl. 165-104.160.

Komatsubara, Yoshinobu: *See*—
Hamada, Takeshi; and Komatsubara, Yoshinobu, 4,500,501, Cl. 423-239.000.

Kominami, Yasuo: *See*—
Sato, Tetsuo; and Kominami, Yasuo, 4,500,932, Cl. 360-65.000.

Komoda, Akira; Hirooka, Yasuhiro; Yoshihara, Takahisa; and Matsuda, Akira, to Kawasaki Steel Corporation. Counter flow device for electroplating apparatus. 4,500,400, Cl. 204-206.000.

Komori Printing Machinery Co., Ltd.: *See*—
Uno, Chiyomatsu, 4,499,825, Cl. 101-167.000.

Kona Corporation: *See*—
Devellian, Richard D.; and Swenson, Paul M., 4,500,279, Cl. 425-548.000.

Kondo, Haruyoshi: *See*—
Takahashi, Hideaki; Hayakawa, Kiyoharu; Kondo, Haruyoshi; and Takeuchi, Takashi, 4,500,412, Cl. 204-425.000.

Kondo, Kiyoshi; and Matsui, Kiyohide, to Sagami Chemical Research Center. Process for preparing dihalovinylcyclopropanecarboxylic acids. 4,500,733, Cl. 562-506.000.

Kondo, Syunichi: *See*—
Sano, Kenji; Kondo, Syunichi; and Sato, Hideo, 4,500,623, Cl. 430-83.000.

Kone OY: *See*—
Luomanen, Asko, 4,499,645, Cl. 29-445.000.
Makinen, Heimo; and Suur-Askola, Seppo, 4,499,972, Cl. 187-29.00R.

Koning, Menno G.: *See*—
Westhaver, Robert O.; Walker, Gary; and Koning, Menno G., 4,499,778, Cl. 74-5.00F.

Konishiroku Photo Industry Co., Ltd.: *See*—
Haneda, Satoshi; Itaya, Masahiko; and Tanaka, Minoru, 4,500,616, Cl. 430-45.000.
Menjo, Hiroshi; and Watanabe, Yoshikazu, 4,500,633, Cl. 430-505.000.
Sakamoto, Eiichi; Kawasaki, Mikio; Ono, Kouji; Fukuoji, Kakujulo; and Fujimori, Noboru, 4,500,631, Cl. 430-413.000.

Konno, Tatsuo: *See*—
Sunouchi, Akio; Suzuki, Ryuji; Fujino, Masahisa; and Konno, Tatsuo, 4,500,186, Cl. 354-234.000.

Konrad, Charles E.; Gareis, Ronald E.; and Lodhia, Amratlal C., to General Electric Company. Dual motor proportioning control. 4,500,818, Cl. 318-52.000.

Kopko, John J.; and Hays, Dan A., to Xerox Corporation. Self-spaced development system. 4,499,851, Cl. 118-658.000.

Kopstad, Guennar: *See*—
Tvedt, Kare E.; Kopstad, Guennar; and Haugen, Olav A., 4,499,670, Cl. 34-143.000.

Korenberg, Michael. Hot-box signalling devices. 4,501,006, Cl. 377-45.000.

Kornfeld, Edmund C.: *See*—
Bach, Nicholas J.; Kornfeld, Edmund C.; and Titus, Robert D., 4,500,545, Cl. 514-619.000.

Koshio, Yoshihiro; Kato, Tadao; and Kawano, Hikaru, to Musashi Co., Ltd.; and Hitachi Engineering Kabushiki Kaisha. Apparatus for sorting and counting a number of banknotes. 4,500,002, Cl. 209-534.000.

Kotter, Gustav; and Mutschlknaus, Peter, to Multimatic Maschinen GmbH & Co. Dry-cleaning apparatus. 4,499,744, Cl. 68-210.000.

Koumura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, to Canon Kabushiki Kaisha. Original reading apparatus. 4,500,918, Cl. 358-75.000.

Kovacs, Ferenc: *See*—
Bullock, Lance W.; Vlahek, Josip; and Kovacs, Ferenc, 4,500,277, Cl. 425-387.100.

Kovacs, Robert J.: *See*—
Gerber, James E.; Kovacs, Robert J.; and Herrmann, Willy, 4,500,030, Cl. 228-125.000.

Koyama, Haruo: *See*—
Matsuda, Masanori; Koyama, Haruo; and Miyakawa, Nobuhiro, 4,500,897, Cl. 346-209.000.

Kozbur, Nestor: *See*—
Reba, Imants; Schutz, Rudolph W.; and Kozbur, Nestor, 4,499,801, Cl. 83-24.000.

Kozel, James A., deceased: *See*—
Rasmussen, Donald C., deceased; and Kozel, James A., deceased, 4,500,068, Cl. 251-205.000.

Kozel, Violet M., executor: *See*—
Rasmussen, Donald C., deceased; and Kozel, James A., deceased, 4,500,068, Cl. 251-205.000.

Kraft, Wayne R.: *See*—
Cases, Moises; Kraft, Wayne R.; Stahl, William L., Jr.; and Thoma, Nandor G., 4,500,800, Cl. 307-468.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Kuhnke, Klaus; Bege, Dietmar; Puthawala, Anwer; and Witrowsky, Gunter, 4,500,449, Cl. 252-628.000.
Siegfried, Peter; and Wenger, Martin, 4,500,323, Cl. 48-197.00R.
Trassl, Werner, 4,500,066, Cl. 251-26.000.

Kramer, Thomas, to Coca-Cola Company, The. Truck with exchangeable load carrier. 4,500,248, Cl. 414-459.000.

Krasselt, Manfred M.: *See*—
Apontoweil, Peter; and Krasselt, Manfred M., 4,500,638, Cl. 435-235.000.

Kraus, Walter: *See*—
Bohn, Hans; and Kraus, Walter, 4,500,451, Cl. 260-112.00R.

Krause, Brian W.: *See*—
Hay, Robert A., II; and Krause, Brian W., 4,499,749, Cl. 72-325.000.

Kreismer, Heinz: *See*—
Napp, Gerhard; Bieringer, Ulrich; Kreismer, Heinz; and Goseberg, Walter, 4,500,833, Cl. 323-359.000.

Kriz, Ronald D., to United States of America, Commerce. Systems for monitoring changes in elastic stiffness in composite materials. 4,499,770, Cl. 73-599.000.

Krogh, James A., to PPG Industries, Inc. Method for preparing N-benzyloxycarbonyl amino acids containing additional functionality. 4,500,726, Cl. 56-160.000.

Krohn, David A.; Buffone, Louis A.; and Vinarub, Edmond I., to Eotec Corporation. Method and components for remote reading of utility meters. 4,500,870, Cl. 340-347.00P.

Krojer, Hubert, to Dornier GmbH. Aircraft propulsion system arrangement. 4,500,055, Cl. 244-55.000.

Kroupa, Loretta A.; and Relyea, Elton H., to Dow Corning Corporation. Extrudable, curable polyorganosiloxane compositions. 4,500,659, Cl. 523-213.000.

Kruesi, Paul R.; and Kruesi, William H., to Cato Research, Inc. Ammonium chloride-ammonium hydroxide strip for the recovery of anhydrous zinc chloride. 4,500,498, Cl. 423-100.000.

Kruesi, William H.: *See*—
Kruesi, Paul R.; and Kruesi, William H., 4,500,498, Cl. 423-100.000.

Krug, Russell R.; and Schmidt, Peter C., to Chevron Research Company. Separation of reacted hydrocarbons and catalyst in fluidized catalytic cracking. 4,500,423, Cl. 208-161.000.

Kruger, Bruno: *See*—
Goyert, Wilhelm; Grimm, Wolfgang; Awater, Albert; Wagner, Hans; and Kruger, Bruno, 4,500,671, Cl. 524-494.000.

Kruit, Pieter: *See*—
Le Poole, Jan B.; and Kruit, Pieter, 4,500,787, Cl. 250-427.000.

Kruper, William J., Jr.; and Swart, Daniel J., to Dow Chemical Company, The. Carbon dioxide oxirane copolymers prepared using double metal cyanide complexes. 4,500,704, Cl. 528-405.000.

Krutenat, Richard C., to Exxon Research & Engineering Co. Method of forming a protective aluminum-silicon coating composition for metal substrates. 4,500,364, Cl. 148-6.14R.

KRW Energy Systems Inc.: *See*—
Hamm, James R.; and Young, William E., 4,499,722, Cl. 60-39.120.

Kub, Francis J.; and Evey, William M., to Westinghouse Electric Corp. Small dimension field effect transistor using phosphorous doped silicon glass reflow process. 4,499,653, Cl. 29-571.000.

Kubinyi, Hugo; Traut, Martin; and Gries, Josef, to BASF Aktiengesellscaft. Benzoylthio compounds, their preparation and their use as drugs. 4,500,467, Cl. 514-2.000.

Kubo, Kanji; Momose, Tsugio; and Izumi, Chikahiko, to Hitachi, Ltd. Apparatus for invalidating the content of an instruction buffer by program store compare check. 4,500,959, Cl. 364-200.000.

Kubo, Keishi; Watanabe, Hideo; Takigawa, Nobuhiro; Hagiri, Minoru; and Kawasaki, Kanjiro, to Ricoh Company, Ltd. Heat-sensitive recording medium affording patterns with different colors. 4,500,896, Cl. 346-204.000.

Kubota, Hajime, to Dai Nippon Insatsu Kabushiki Kaisha. Process for producing coincidently embossed decorative sheets. 4,500,373, Cl. 156-79.000.

Kubota, Hitoshi; Hamamatsu, Seiji; Yambe, Teluo; and Takahashi, Toshiyuki, to Nissan Motor Company, Limited; Tokico Ltd.; and Nippon Air Brake Co., Ltd. Fluid reservoir with fluid-level sensor. 4,500,761, Cl. 200-84.00C.

Kubota, Naohiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,500,663, Cl. 524-101.000.

Kuch, Philip L.: *See*—
Jevnikar, Mary G.; and Kuch, Philip L., 4,500,505, Cl. 423-416.000.

Kudelski, S.A.: *See*—
Kudelski, Stefan, 4,500,817, Cl. 318-7.000.

Kudelski, Stefan, to Kudelski, S.A.; and Ampex Corporation. Tape tension sensor and servo embodying same. 4,500,817, Cl. 318-7.000.

Kuhl, Henry Y.: *See—*
Kuhl, Jeffrey B., 4,499,623, Cl. 15-3.130.

Kuhl, Jeffrey B., to Kuhl, Henry Y. Egg cleaning apparatus. 4,499,623, Cl. 15-3.130.

Kuhlein, Klaus: *See—*
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,500,437, Cl. 252-8.55C.

Kuhn, Franz; Lippek, Wilfried; Mollgaard, Klaus; and Redecker, Friedrich, to Dr.-Ing. Rudolf Hell GmbH. Apparatus for converting digital chrominance signals of a cartesian color coordinate system into digital color signals and saturation signals of a polar color coordinate system and a transformation circuit. 4,500,972, Cl. 364-526.000.

Kuhnke, Klaus; Bege, Dietmar; Puthawala, Anwer; and Wittrowsky, Gunter, to Kraftwerk Union Aktiengesellschaft. Method for solidifying boron-containing radioactive residues. 4,500,449, Cl. 252-628.000.

Kuisma, Heikki T.; Lehto, Ari; and Jalava, Jouko S., to Vaisala Oy. Capacitive humidity sensor and method for the manufacture of same. 4,500,940, Cl. 361-286.000.

Kulin, Ralph; Granzow, Daniel B.; and Danielsen, Brant R., to Baxter Travenol Laboratories, Inc. Device for providing antibacterial radiation. 4,500,788, Cl. 250-455.100.

Kumar, Narayan G., to Johnson & Johnson Dental Products Company. Dental restorative compositions having improved mechanical properties and hydrolytic stability. 4,500,657, Cl. 523-116.000.

Kunze, Dieter, to Siemens Aktiengesellschaft. Splice carrier for light waveguide cables. 4,500,166, Cl. 350-96.200.

Kuramochi, Koujiro; and Takahashi, Tokuyuki, to Toyota Jidosha Kabushiki Kaisha. Automatic transmission with overdrive housing including its own accumulator. 4,499,789, Cl. 74-740.000.

Kuramoto, Kenji, to Ebara Corporation. Apparatus for monitoring inside of treating column. 4,500,793, Cl. 250-574.000.

Kuraray Co., Ltd.: *See—*
Kitamura, Takanori; Matsumoto, Mitsuo; and Tamura, Masuhiko, 4,500,727, Cl. 560-179.000.

Kurihara, Kazuhiko: *See—*
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Tsuyama, Setsuya; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,499,639, Cl. 28-282.000.

Kurihara, Yukitada: *See—*
Miyanaga, Akiyoshi; and Kurihara, Yukitada, 4,500,431, Cl. 210-656.000.

Kuroda, Masato: *See—*
Akano, Shinichi; Goto, Tsutomu; Watanabe, Hiroshi; Kuroda, Masato; Ishikawa, Sakae; and Matsumoto, Ryoichiro, 4,499,754, Cl. 73-861.120.

Kuroda Precision Industries Ltd.: *See—*
Tsuchiya, Tatsuo; and Hozumi, Kazuhiro, 4,500,075, Cl. 267-8.00R.

Kuroda, Shigeaki; Senshu, Takao; Oguni, Kensaku; Mochizuki, Taketoshi; Yasuda, Hiromu; Ishibane, Kyuhei; Atsumi, Akira; Kimura, Hideyuki; and Hatada, Toshio, to Hitachi, Ltd. Expansion valve. 4,500,035, Cl. 236-92.00B.

Kuroki, Yoshifumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera system including flash and status indicating control circuit. 4,500,190, Cl. 354-416.000.

Kurtz, Leonard D.; and LiCausi, Joseph, to BioResearch Inc. Autotransfusion device with twisted collection bag. 4,500,308, Cl. 604-4.000.

Kusaka, Yosuke; and Fukuhara, Toru, to Nippon Kogaku K.K. Image plane deviation amount detecting device. 4,500,778, Cl. 250-204.000.

Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, to Hitachi, Ltd. Gas laser. 4,500,998, Cl. 372-61.000.

Kuwayama, Tetsuro: *See—*
Hashimoto, Seiji; Tanaka, Nobuyoshi; Suga, Akira; and Kuwayama, Tetsuro, 4,500,913, Cl. 358-44.000.

Kwon, Oh K.: *See—*
Jones, David G.; and Kwon, Oh K., 4,500,839, Cl. 324-204.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, 4,500,640, Cl. 435-253.000.

L.A.S. Ricouard S.A.: *See—*
Ricouard, Jacques; and Quillet, Jean-Pierre, 4,499,745, Cl. 70-285.000.

L. Schuler GmbH: *See—*
Gerber, Heinz; Adam, Klaus; and Horn, Heinz, 4,499,750, Cl. 72-351.000.

Lacour, Alain P.: *See—*
Platel, Alain Y.; Lacour, Alain P.; and Bourgery, Guy R., 4,500,531, Cl. 514-255.000.

Lacroix, Roger: *See—*
Hugelshofer, Paul; Bruttel, Beat; Pfenninger, Heinz; and Lacroix, Roger, 4,500,321, Cl. 8-527.000.

Lafortune, Lucien; and Rouette, Andre . Safety closure cap. 4,500,006, Cl. 215-224.000.

Lagana', Vincenzo; and Cavallanti, Virginio, to Snamprogetti S.p.A. Process for the production of urea. 4,500,734, Cl. 564-72.000.

LaGross, Dennis L.: *See—*
Plank, Vernon G.; Matthews, Anthony J.; Berthel, Robert O.; and LaGross, Dennis L., 4,499,761, Cl. 73-170.00R.

Lai, John T., to B. F. Goodrich Company, The. Polysubstituted α-aminoacetamides. 4,500,662, Cl. 524-99.000.

Lakshmanan, Pallavoor R., to Gulf Oil Corporation. Adhesive composition. 4,500,661, Cl. 524-77.000.

LaLonde, Paul D., to Donn Incorporated. Suspended ceiling with removable tee sections. 4,499,697, Cl. 52-98.000.

Lamparsky, Dietmar; and Kaiser, Roman, to Givaudan Corporation. 2-Methyl-2-buten-1-yl tiglate. 4,500,729, Cl. 560-225.000.

Lampe, Guy W.: *See—*
Madewell, James A.; Molitor, Edwin A.; Crowe, Norman P.; Lampe, Guy W.; and Pavey, Charles F., 4,500,245, Cl. 414-108.000.

Lampe, Louis F.: *See—*
Furst, Emanuel F.; Lampe, Louis F.; and Woods, William L., 4,499,903, Cl. 128-675.000.

Lampert, Heinz, to Werner Looser Maschinenbau + Hydraulik. Piston-cylinder device. 4,499,813, Cl. 92-31.000.

Lang, Kevin W.: *See—*
Liggett, Louis G.; Lang, Kevin W.; Wyss, Clement R.; and Williams, Richard A., 4,500,553, Cl. 426-101.000.

Lang, Richard D.: *See—*
Bolton, Theodore S.; Leech, Brad G.; and Lang, Richard D., 4,499,816, Cl. 98-40.260.

Lang, Stephen P.: *See—*
Jacobi, Stephen F.; Haight, Robert E.; Schletzbaum, John W.; Martin, Yolanda E.; and Lang, Stephen P., 4,500,874, Cl. 340-607.000.

Lange, Francois: *See—*
Rascle, Roger; and Lange, Francois, 4,500,486, Cl. 264-335.000.

Lange, Heinz; Rix, Albert; and Drogi, Dieter, to Olympia Werke AG. Method and apparatus for guiding the paper in typewriters or similar office machines. 4,500,219, Cl. 400-568.000.

Lange International S.A.: *See—*
Chalmers, Edward L., II, 4,499,676, Cl. 36-120.000.

Lange, Norbert: *See—*
Vock, Jurgen; Pinck, Peter; Lange, Norbert; Schmalfeld, Erwin; and Petersen, Kurt-Eckard, 4,500,770, Cl. 219-121.0LK.

Langston, Metty S. K., to General Foods Corporation. Anthocyanin colorant from grape pomace. 4,500,556, Cl. 426-540.000.

Lanier Business Products, Inc.: *See—*
Plunkett, Luther C., Jr., 4,500,753, Cl. 179-6.030.

Laplanche, Michel: *See—*
Astier, Jean-Francois; Bessaguet, Louis; and Laplanche, Michel, 4,500,272, Cl. 425-78.000.
Astier, Jean-Francois; Bessaguet, Louis; and LaPlanche, Michel, 4,500,280, Cl. 425-569.000.

Lappos, Nicholas D.: *See—*
Zagranski, Raymond D.; Howlett, James J.; and Lappos, Nicholas D., 4,500,966, Cl. 364-432.000.

Lardellier, Alain M. J.: *See—*
Kervistin, Robert; Lardellier, Alain M. J.; Mazeaud, Georges; and Crozet, Francois E. G., 4,500,143, Cl. 384-467.000.

Larsen, Richard R., to Pacific Scientific Company. Automatic bellows welder and method for using same. 4,500,026, Cl. 228-44.10R.

Lasag AG: *See—*
Roussel, Philippe, 4,499,897, Cl. 128-303.100.

Laser, Vadim. Method and apparatus for remotely reading and decoding bar codes. 4,500,776, Cl. 235-162.000.

Lasky, Richard J., to Trans-World Manufacturing Corporation. 3D Display. 4,500,088, Cl. 272-8.00M.

Lasoen, Jean J., to Massey-Ferguson Services N.V. Tractor draft sensing apparatus with sensing unit positioned outboard of each link. 4,499,775, Cl. 73-862.570.

Lassen, Charles L., to Kollmorgen Technologies Corporation. Process for the manufacture of substrates to interconnect electronic components. 4,500,389, Cl. 156-643.000.

LaTulip, Randy J., to Dow Chemical Company, The. Thermosetting polymers from aromatic aldehydes, azines and isopropenyl phenols. 4,500,690, Cl. 525-502.000.

Laurent, Henry: *See—*
Nickisch, Klaus; Bittler, Dieter; Laurent, Henry; Wiechert, Rudolf; and Losert, Wolfgang, 4,500,522, Cl. 514-173.000.

Lautenschlager, Gerhard W., to Karl Lautenschlager KG, Mobelbeschlagfabrik. Furniture hinge permitting door opening angle of 110 degree or more. 4,499,631, Cl. 16-370.000.

Lautenschlager, Horst: *See—*
Lautenschlager, Karl, Jr.; and Lautenschlager, Horst, 4,500,140, Cl. 308-3.800.

Lautenschlager, Karl, Jr.; and Lautenschlager, Horst, to Karl Lautenschlager KG, Mobelbeschlagfabrik. Slide for drawers and the like. 4,500,140, Cl. 308-3.800.

Law, Denny B., to Unique Functional Products. Vehicle suspension system. 4,500,113, Cl. 280-716.000.

Lawrence, Robert H., Jr.; and Hill, Phillip E., to Agrigenetics Research Associates Limited. Hybrid Brassica seed production. 4,499,687, Cl. 47-58.000.

Laws, William R.; and Reed, Geoffrey R., to Encomech Engineering Services Limited. Heat shield arrangements for a rolling mill. 4,499,746, Cl. 72-13.000.

Lawton, Carl W.: *See—*
Loomis, Robert W.; and Lawton, Carl W., 4,499,860, Cl. 122-510.000.

Leach, Gary M.: *See—*
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Lear Siegler, Inc.: *See—*
Murphy, Randall T.; and Heling, Dennis, 4,500,136, Cl. 297-284.000.

Leavitt, Philip J.: *See—*
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Lebreton, Jacques: *See—*
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Leconte, Philippe: *See—*
Gauthier-Lafaye, Jean; Perron, Robert; Gallucci, Jacques; and Leconte, Philippe, 4,500,473, Cl. 260-548.000.
Lee, Agnes Y.: *See—*
Cole, Ernest R., Jr.; Lee, Agnes Y.; and Paulson, Danton L., 4,500,398, Cl. 204-117.000.
Lee, Calvin K.; and Rapacz, Deirdre T., to United States of America, Army. Composite thermal insulation liner. 4,500,592, Cl. 428-251.000.
Lee, Jimmy D. Polyurethane foamed in-situ against skin terpolymer comprising ethylene and propylene. 4,500,596, Cl. 428-317.500.
Lee, Joseph Y.: *See—*
D'Agostino, Vincent F.; Lee, Joseph Y.; Zapisek, Stephen; and Schore, George, 4,500,396, Cl. 204-107.000.
Lee, Kyung-Suk, to Daewoo Electronic Co. Telecontrol system for an audio recorder of a radio telephone. 4,500,752, Cl. 179-2.0EA.
Leech, Brad G.: *See—*
Bolton, Theodore S.; Leech, Brad G.; and Lang, Richard D., 4,499,816, Cl. 98-40.260.
Lefevre, Robert P.: *See—*
Ward, Michael A. V.; and Lefevre, Robert P., 4,499,872, Cl. 123-344.000.
Legrand: *See—*
Astier, Jean-Francois; Bessaguet, Louis; and Laplanche, Michel, 4,500,272, Cl. 425-78.000.
Astier, Jean-Francois; Bessaguet, Louis; and LaPlanche, Michel, 4,500,280, Cl. 425-569.000.
Lehner, Gerhard, to Friedmann & Maier Aktiengesellschaft. Control rod system for fuel injection devices for Diesel engines. 4,499,873, Cl. 123-372.000.
Lehto, Ari: *See—*
Kuisma, Heikki T.; Lehto, Ari; and Jalava, Jouko S., 4,500,940, Cl. 361-286.000.
Lehtola, Erkki T., to Tahka Oy. Method and device for turning a long. 4,499,989, Cl. 198-407.000.
Leibensperger, Donna C.: *See—*
Leibensperger, Robert L.; and Leibensperger, Donna C., 4,500,150, Cl. 339-28.000.
Leibensperger, Robert L.; and Leibensperger, Donna C. Device for electrifying dining table. 4,500,150, Cl. 339-28.000.
Leibowitz, Marshall; and George, Douglas A., to Timex Corporation. Electroluminescent lamp for liquid crystal display. 4,500,173, Cl. 350-345.000.
Leininger, Steven, to Tandy Corporation. Memory addressing system. 4,500,956, Cl. 364-200.000.
Leistner, Rolf; and Becker, Herbert, to Brose Fahrzeugteile GmbH und Co. Rotary drive transmission mechanism especially for motor vehicles. 4,499,787, Cl. 74-625.000.
Lejeune, Jean-Pierre: *See—*
Romand-Monnier, Jacques; and Lejeune, Jean-Pierre, 4,500,226, Cl. 403-13.000.
Lemaire, Edmond; and Lebreton, Jacques, to U.S. Philips Corporation. Computer system having an extended directly addressable memory space. 4,500,962, Cl. 364-200.000.
Lenard, Peter: *See—*
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Lennon, Richard E.: *See—*
Elander, Robert C.; Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Shuck, Robert E.; and Tuchman, Walter L., 4,500,750, Cl. 178-22.080.
Lenz, Ehud: *See—*
Tur-Kaspa, Yosef; and Lenz, Ehud, 4,500,126, Cl. 294-86.00R.
Lenz, George R.: *See—*
Chorvat, Robert J.; Lenz, George R.; and Evans Radak, Suzanne, 4,500,708, Cl. 544-34.000.
Lenz, Henry G., to General Electric Company. Method of making a laminated rotor for a dynamoelectric machine. 4,499,660, Cl. 29-598.000.
Leonard, James K.: *See—*
Tuttle, Alan H.; Leonard, James K.; and Długosz, Henry J., 4,500,096, Cl. 277-53.000.
Leonardi, Cornelio: *See—*
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Leong, David S., to Templeton Kenly & Company. Low profile jack construction. 4,500,072, Cl. 254-95.000.
Leonov, Viktor A.: *See—*
Eschenko, Vladislav Y.; Musaev, Irsali K.; Talibdzhanov, Zakhidzhan S.; Leonov, Viktor A.; Bobrov, Anatoly D.; Kirovsky, Efim I.; Gritsenko, Vladimir A.; and Golovanov, Alexandr V., 4,500,282, Cl. 431-184.000.
Le Poole, Jan B.; and Kruit, Pieter, to Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek. Method and a device for furnishing an ion stream. 4,500,787, Cl. 250-427.000.
Lerwill, William E.: *See—*
Ziolkowski, Antoni M.; and Lerwill, William E., 4,500,978, Cl. 367-142.000.
Leshchiner, Adolf: *See—*
Balaza, Endre A.; and Leshchiner, Adolf, 4,500,676, Cl. 525-54.200.
Lew, Hyok S. Chamfered roller mechanical transmission. 4,499,781, Cl. 74-193.000.
Lewandowski, Edward F.; and Peterson, Leroy L., to United States of America, Energy. Method of extruding and packaging a thin sample of reactive material including forming the extrusion die. 4,499,708, Cl. 53-432.000.
Lewandowski, Edward F.: *See—*
Groh, Edward F.; Cassidy, Dale A.; and Lewandowski, Edward F., 4,500,488, Cl. 376-409.000.
Lewis, Kathrine J., to Atlantic Richfield Company. Solar cell laminates. 4,499,658, Cl. 29-588.000.
Lewis, William D., to Epic International Corporation. Method and device for detecting dental cavities. 4,500,294, Cl. 433-215.000.
Lewyn, Lanny L.; and Lucas, Charles H., to Hughes Aircraft Company. Circuit for effecting improved slew rate of operational amplifiers. 4,500,846, Cl. 330-253.000.
Ley, Anthony J., to Enertec. Electronic devices. 4,500,973, Cl. 364-606.000.
Libby, Alfred F. Method for treating alcohol and drug addicts. 4,500,515, Cl. 424-154.000.
LiCausi, Joseph: *See—*
Kurtz, Leonard D.; and LiCausi, Joseph, 4,500,308, Cl. 604-4.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Napp, Gerhard; Bieringer, Ulrich; Kreismer, Heinz; and Goseberg, Walter, 4,500,833, Cl. 323-359.000.
Sommer, Karl H.; Sonntag, Alois; and Pikorz, Wolfgang, 4,500,901, Cl. 357-38.000.
Liebig, Heinrich. Interlocking toggle bolt. 4,500,239, Cl. 411-65.000.
Liepins, Raimond: *See—*
Jahn, Randy K.; and Liepins, Raimond, 4,500,562, Cl. 427-27.000.
Lieu, Dennis K.; and Cooper, Larry, to Sperry Corporation. Dehumidifier apparatus for disk drives. 4,499,736, Cl. 62-3.000.
Liggett, Louis G.; Lang, Kevin W.; Wyss, Clement R.; and Williams, Richard A., to General Foods Corporation. Method of producing a frozen dual-textured confection. 4,500,553, Cl. 426-101.000.
Lihtarova, Ludmila: *See—*
Junek, Jan; Skarka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Hacova, Kveta; Vobornik, Vaclav; Ohlidal, Vladimi; and Lihtarova, Ludmila, 4,499,718, Cl. 57-301.000.
Lill, Melvin H., to FMC Corporation. Individual toe measuring system. 4,500,201, Cl. 356-152.000.
Lim, In C.: *See—*
Schmidt, Manfred; Witman, Mark W.; Reinert, Gerard E.; and Lim, In C., 4,500,653, Cl. 521-90.000.
Lima S.p.A.: *See—*
Reginato, Francesco, 4,500,058, Cl. 246-3.000.
Lindauer Dornier Gesellschaft mbH: *See—*
John, Heinz, deceased; and John nee Ruffler, Friedlinde, heir, 4,499,638, Cl. 28-207.000.
Linde Aktiengesellschaft: *See—*
Reimann, Hans; Frydman, Allen; and Fuchs, Uwe, 4,500,429, Cl. 210-616.000.
Linder, Ernst; Moser, Winfried; and Rieger, Franz, to Robert Bosch GmbH. Arrangement for controlling a internal combustion engine equipped with glow plugs. 4,499,867, Cl. 123-145.00A.
Lindner, Georg H., to M&T Chemicals Inc. Air operated diaphragm pump system. 4,500,264, Cl. 417-395.000.
Lion Corporation: *See—*
Nakaoji, Kazuhiko; Kamao, Mitsugu; Itoh, Hayami; Tatsumi, Shuhei; and Takao, Shoichi, 4,500,041, Cl. 241-16.000.
Lippek, Wilfried: *See—*
Kuhn, Franz; Lippek, Wilfried; Mollgaard, Klaus; and Redecker, Friedrich, 4,500,972, Cl. 364-526.000.
Lipschutz, Lewis D., to International Business Machines Corporation. Directly sealed multi-chip module. 4,500,945, Cl. 361-386.000.
Liquidometer Corporation: *See—*
Beane, Michael J., 4,500,881, Cl. 340-825.730.
Lisco, Richard J., to AT&T Bell Laboratories. Ringing signal generator employing delta-modulation power amplification techniques. 4,500,844, Cl. 330-10.000.
Lisov, Aleksandr I.: *See—*
Zsoka, Istvan; Madar, Laszlo ; Cubin, Anatoly A.; Gaivoronsky, Albert A.; Farukshin, Lev H.; Morzsic, Piotr A.; Lisov, Aleksandr I.; and Galusztainc, Vladilen A., 4,499,947, Cl. 166-179.000.
Liston, Allen L., to FMC Corporation. Adjustment means for operator controls. 4,499,963, Cl. 180-90.600.
Litchfield, John: *See—*
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Litton Systems, Inc.: *See—*
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MacNeal, Bruce E., 4,500,177, Cl. 350-376.000.
Schebler, Bernard J., 4,499,914, Cl. 137-81.100.
Liu, Christopher S.: *See—*
Kaufman, Benjamin J.; Liu, Christopher S.; and Sung, Rodney L., 4,500,440, Cl. 252-51.50A.
Liu, Hueichi R.: *See—*
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
Lloyd, William A.: *See—*
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LMT Radio Professionnelle: *See—*
Marchand, Maurice; and Haentjens, Yan, 4,500,848, Cl. 330-285.000.

Lockard, Walter G.: *See*—
Haury, Gilbert E.; Patel, Nathalal G.; Lockard, Walter G.; and Wiatrak, Thomas R., 4,500,102, Cl. 280-242.0WC.

Lockheed Missiles & Space Company, Inc.: *See*—
Galbraith, Andrew D., 4,500,613, Cl. 429-69.000.

Lockstedt, Alan W.: *See*—
Vezirian, Edward; Quinones, Richard J.; and Lockstedt, Alan W., 4,499,642, Cl. 29-149.50R.

Lodhia, Amratlal C.: *See*—
Konrad, Charles E.; Gareis, Ronald E.; and Lodhia, Amratlal C., 4,500,818, Cl. 318-52.000.

Loev, Bernard; Shroff, James R.; and Desai, Rohit, to USV Pharmaceutical Corporation. Antihypertensive 4[(3-alkylamino-2-hydroxypropyl)-oxyiminomethyl phenyl]-1,4-dihydropyridines. 4,500,527, Cl. 514-223.000.

Loev, Bernard; Jones, Howard; and Shroff, James R., to USV Pharmaceutical Corporation. N-Substituted 1,4-dihydropyridines and pharmaceutical compositions. 4,500,528, Cl. 514-228.000.

Loev, Bernard; Jones, Howard; and Suh, John T., to USV Pharmaceutical Corporation. 1-(Substituted aminoalkyl)-1,4-dihydropyridines. 4,500,532, Cl. 514-256.000.

Logullo, Francis M., Sr.: *See*—
Irwin, Robert S.; and Logullo, Francis M., Sr., 4,500,699, Cl. 528-128.000.

Lok, Brent M. T.; Marcus, Bonita K.; and Flanigen, Edith, to Union Carbide Corporation. Titanium-containing molecular sieves. 4,500,651, Cl. 502-208.000.

Lombardino, Joseph G.; and Harbert, Charles A., to Pfizer Inc. Method of regulating the immune response with pyridine derivatives. 4,500,535, Cl. 514-277.000.

Long, Charles P. Accumulator for a carton filling and packing production line. 4,499,987, Cl. 198-347.000.

Long, Thomas F.: *See*—
Beyer, Henry R.; DeSipio, Richard G.; Long, Thomas F.; and Ritz, Joseph, 4,500,885, Cl. 343-456.000.
Naubereit, Henry; Long, Thomas F.; Picard, Salvatore R.; and Ritz, Joseph, 4,500,886, Cl. 343-456.000.

Longuet, Michel: *See*—
Peltier, Gerard; Longuet, Michel; and Midgley, Charles A., 4,500,591, Cl. 428-251.000.

Longview Fibre Company: *See*—
Nordstrom, Duane M., 4,500,381, Cl. 156-205.000.

Loomis, Robert W.; and Lawton, Carl W., to Combustion Engineering, Inc. Furnace buckstay design. 4,499,860, Cl. 122-510.000.

Looper, David W.: *See*—
Roberts, Don M.; and Looper, David W., 4,500,944, Cl. 361-384.000.

Lopato, Georgy P.: *See*—
Sidorenko, Georgy I.; Lopato, Georgy P.; Yakubovich, Vladimir M.; Nikitin, Yaroslav G.; Usachev, Oleg I.; and Vorobiev, Anatoly P., 4,499,904, Cl. 128-703.000.

Lorant, Stefan, to United Stirling AB. Hot gas engine. 4,499,727, Cl. 60-525.000.

Lord, John G., to Bergeson, Lloyd. Sail rigging and control system. 4,499,841, Cl. 114-98.000.

L'Oreal: *See*—
Gueret, Jean-Louis H., 4,500,939, Cl. 361-221.000.

Lori, Domenico: *See*—
Credali, Lino; Martini, Emilio; and Lori, Domenico, 4,500,594, Cl. 428-284.000.

Lormeau, Jean-Claude; Petitou, Maurice; and Choay, Jean, to Choay S.A. Mucopolysaccharides having biological properties, preparation and method of use. 4,500,519, Cl. 514-56.000.

Losert, Wolfgang: *See*—
Nickisch, Klaus; Bittler, Dieter; Laurent, Henry; Wiechert, Rudolf; and Losert, Wolfgang, 4,500,522, Cl. 514-173.000.

Louden, William G.; and Louden, William S., to Louden, William Gordon. Flat paper and method of manufacturing involving controlled drying conditions. 4,500,607, Cl. 428-511.000.

Louden, William Gordon: *See*—
Louden, William G.; and Louden, William S., 4,500,607, Cl. 428-511.000.

Louden, William S.: *See*—
Louden, William G.; and Louden, William S., 4,500,607, Cl. 428-511.000.

Lourenco, Jose A.: *See*—
Keramidas, Vassilis G.; and Lourenco, Jose A., 4,500,367, Cl. 148-171.000.

Lovell, Edward J.: *See*—
Janisiewicz, Stanley W.; Hills, Maynard J.; and Lovell, Edward J., 4,500,246, Cl. 414-414.000.

Lovercheck, Dale R.; and Curran, George P., to Conoco Inc. Hydride cold start container in fuel treatment and distribution apparatus and method. 4,499,864, Cl. 123-3.000.

Low, Robert N.: *See*—
Buck, Roy T.; Cloutier, Frank L.; Erni, R. Ernst; Low, Robert N.; and Terry, F. Duncan, 4,500,895, Cl. 346-140.00R.

LTV Aerospace and Defense Co.: *See*—
Patten, James W.; Moss, Ronald W.; and Forcht, Brennan A., 4,500,602, Cl. 428-408.000.

Lubcke, Hartmut; and Backhaus, Martin, to Nixdorf Computer AG. Circuit arrangement for the control of the transmission of digital signals, particularly PCM-signals, between stations of a time division multiplex telecommunication network particularly PCM-time division multiplex telecommunication network. 4,500,991, Cl. 370-88.000.

Lucas, Charles H.: *See*—
Lewyn, Lanny L.; and Lucas, Charles H., 4,500,846, Cl. 330-253.000.

Lucas Industries Public Limited Company: *See*—
Skinner, Robert T. J., 4,499,884, Cl. 123-506.000.

Lucas, Raymond, to Bobst SA. Device for severing blanks of a batch of die cut sheets. 4,500,022, Cl. 225-97.000.

Luciani, Wayne. Taping doughnut. 4,500,580, Cl. 428-43.000.

Luebrecht, Donald; and Klopfleisch, Kim A., to Crown Controls Corporation. Material handling vehicle having improved chain monitoring. 4,499,971, Cl. 187-9.00R.

Lundblad, Leif. Apparatus in banks, post offices and similar establishments for dispensing valuable papers. 4,500,013, Cl. 221-285.000.

Lundstrom, Kristian, to Tamfelt Oy AB. Conveyor felt for paper making and a method of manufacturing such a felt. 4,500,588, Cl. 428-212.000.

Lung-Tung, Chao. Method for the salvage of a sunken vessel. 4,499,840, Cl. 114-51.000.

Luomanen, Asko, to Kone OY. Procedure for manufacturing a roof element. 4,499,645, Cl. 29-445.000.

Lupke, Manfred A. A. Forming single wall bells in double wall pipe. 4,500,284, Cl. 425-511.000.

Luss, V. Gerold, to H. B. Fuller Co. Antimicrobial composition for a semipermeable membrane. 4,500,517, Cl. 424-162.000.

Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, to Process Research Development & Management, Inc. Method for the treatment of wastewater sludge. 4,500,428, Cl. 210-609.000.

Lyons, William G., III, to Brimfield Precision, Inc. Fiber-optic illuminated microsurgical scissors. 4,499,899, Cl. 128-305.000.

M.A.N. Maschinenfabrik Ausburg-Nurnberg AG: *See*—
Neitz, Alfred; D'Alfonso, Nunzio; and Pickel, Hans, 4,499,871, Cl. 123-276.000.

M-B-W Inc.: *See*—
Maass, Helmut, 4,499,779, Cl. 74-61.000.

M&T Chemicals Inc.: *See*—
Lindner, Georg H., 4,500,264, Cl. 417-395.000.

Maass, Helmut, to M-B-W Inc. Vibratory compactor. 4,499,779, Cl. 74-61.000.

Mabuchi Motor Co., Ltd.: *See*—
Akiyama, Takeshi, 4,500,804, Cl. 310-40.0MM.

Macartney, Derek L.: *See*—
McDonald, Robert C.; and Macartney, Derek L., 4,500,228, Cl. 406-61.000.

Machida, Toyotaka, to Victor Company of Japan, Ltd. Synchronizing signal generating apparatus. 4,500,909, Cl. 358-17.000.

Machnee, Cecil B., to Morris Rod-Weeder Co. Ltd. Dispensing wheel and shaft mounting arrangement therefor. 4,500,017, Cl. 222-288.000.

Machnee, Cecil B., to Morris Rod-Weeder Company, Limited. Agricultural implement hitch assembly. 4,500,105, Cl. 280-468.000.

MacKay, Duncan: *See*—
Madden, Allan C.; Cellucci, Robert; Hoshida, Robert A.; and MacKay, Duncan, 4,499,768, Cl. 73-462.000.

Mackay, Robert D., to AT&T Technologies, Inc. Solder-bearing lead. 4,500,149, Cl. 339-17.00C.

Mackey, Richard C., to Novation, Inc. Solid state off hook phone line load. 4,500,754, Cl. 179-81.00R.

MacLachlan, George F.: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.

MacNeal, Bruce E., to Litton Systems, Inc. Method and device for improving a conductive switching grid for switchable magnetic elements. 4,500,176, Cl. 350-376.000.

MacNeal, Bruce E., to Litton Systems, Inc. Method and device for creating switchable redundancy with a magnetic element. 4,500,177, Cl. 350-376.000.

Madar, Laszlo : *See*—
Zsoka, Istvan; Madar, Laszlo ; Cubin, Anatoly A.; Gaivoronsky, Albert A.; Farukshin, Lev H.; Morzsic, Piotr A.; Lisov, Aleksandr I.; and Galusztainc, Vladilen A., 4,499,947, Cl. 166-179.000.

Madden, Allan C.; Cellucci, Robert; Hoshida, Robert A.; and MacKay, Duncan, to Coats Wheel Balancer Corp. Cantilever support for an apparatus to determine the imbalance in a rotating object. 4,499,768, Cl. 73-462.000.

Madewell, James A.; Molitor, Edwin A.; Crowe, Norman P.; Lampe, Guy W.; and Pavey, Charles F., to Multifold-International, Inc. Machine for accumulating edgewise supported articles. 4,500,245, Cl. 414-108.000.

Maeda, Naoyuki: *See*—
Abe, Michio; and Maeda, Naoyuki, 4,499,964, Cl. 180-142.000.

Maestrelli, Gino, to Maestrelli S.P.A. Clothing drycleaning machine. 4,499,743, Cl. 68-18.00C.

Maestrelli S.P.A.: *See*—
Maestrelli, Gino, 4,499,743, Cl. 68-18.00C.

Maffrand, Jean-Pierre: *See*—
Frehel, Daniel; Maffrand, Jean-Pierre; and Vallee, Eric, 4,500,534, Cl. 514-301.000.

Magyar Szenhidrogenipari Kutatofejleszto Intezet: *See*—
Zsoka, Istvan; Madar, Laszlo ; Cubin, Anatoly A.; Gaivoronsky, Albert A.; Farukshin, Lev H.; Morzsic, Piotr A.; Lisov, Aleksandr I.; and Galusztainc, Vladilen A., 4,499,947, Cl. 166-179.000.

Maher, Galeb H., to Sprague Electric Company. Ag/Pd electroding powder and method for making. 4,500,368, Cl. 148-431.000.

Maher, Tommy B.: *See*—
Mattingly, William R., Jr.; Johnson, Lyle; and Maher, Tommy B., 4,500,153, Cl. 339-89.00M.
Mahr, Peter F., to North Sails, Inc. Sail cloth and sail made therefrom. 4,499,842, Cl. 114-103.000.
Maiden, Adrian J., to Ferranti, PLC. Non-dispersive optical determination of gas concentration. 4,500,207, Cl. 356-409.000.
Maier, Jakob: *See*—
Hoefelmayr, Tilman; and Maier, Jakob, 4,499,854, Cl. 119-14.320.
Mail-Ex Corporation: *See*—
Russell, Robert J., 4,499,705, Cl. 53-266.00A.
Maiocchi, John, to GTE Communications Products Corporation. Coating apparatus for bodies of electrical components having axial leads. 4,499,848, Cl. 118-45.000.
Majerus, John N.; and Walters, William P., to United States of America, Army. High lethality warheads. 4,499,830, Cl. 102-476.000.
Majima, Mitsue: *See*—
Sakamura, Yoshikazu; and Majima, Mitsue, 4,499,647, Cl. 29-509.000.
Makinen, Heimo; and Suur-Askola, Seppo, to Elevator GmbH; and Kone Oy. Speed control system for a motor with short-circuited rotor. 4,499,972, Cl. 187-29.00R.
Malbec, Yves; Boisot, Yves; Bontemps, Daniel; and Duhamel, Georges, to Thomson-CSF. Thermostat-controlled electric switch. 4,500,760, Cl. 200-83.00C.
Malpass, Dennis B., to Exxon Research & Engineering Co. Long chain branching in polyolefins from ziegler-natta catalysts. 4,500,648, Cl. 502-115.000.
Mandeberg, Richard D., to Research and Development Institute for Infosystems, Inc. Method and apparatus for standardizing nonstandard video signals. 4,500,908, Cl. 358-11.000.
Mannesmann Aktiengesellschaft: *See*—
Ehrich, Gerd; and Dobner, Eberhard, 4,499,960, Cl. 177-25.000.
Hasselmann, Heinz; and Muenzebrock, Anton, 4,500,969, Cl. 364-508.000.
Mano, Seiji: *See*—
Katagi, Takashi; and Mano, Seiji, 4,500,882, Cl. 343-372.000.
Manton, John C.; and Okin, Kenneth, to Digital Equipment Corporation. Memory controller with data rotation arrangement. 4,500,958, Cl. 364-200.000.
Marathon Electric Mfg. Corp.: *See*—
Keglewitsch, Josef; and Stechschulte, Theodore J., 4,500,161, Cl. 339-242.000.
Keglewitsch, Josef; and Stechschulte, Theodore J., 4,500,162, Cl. 339-252.00F.
Marchand, Maurice; and Haentjens, Yan, to LMT Radio Professionnelle. Field effect transistor microwave amplifier. 4,500,848, Cl. 330-285.000.
Marcus, Bonita K.: *See*—
Lok, Brent M. T.; Marcus, Bonita K.; and Flanigen, Edith, 4,500,651, Cl. 502-208.000.
Marissen, Roelof: *See*—
Schijve, Jacobus; Vogelesang, Laurens B.; and Marissen, Roelof, 4,500,589, Cl. 428-213.000.
Marschner, Frederick J.: *See*—
Duke, Alan H.; Hartung, Michael H.; Marschner, Frederick J.; and Nolan, Kenneth P., 4,500,954, Cl. 364-200.000.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Tetrahydrofuran-2-ones. 4,500,720, Cl. 549-313.000.
Martin, Alan B.; and Jackson, Ernest V., to Mason & Hanger-Silas Mason Co., Inc. Enhanced oil recovery process and apparatus. 4,499,946, Cl. 166-57.000.
Martin, Henry, to Ciba-Geigy Corporation. Oxime derivatives for protecting plant crops. 4,500,347, Cl. 71-97.000.
Martin, Raymond H.: *See*—
Garganese, Ugo S.; Griffin, John R.; and Martin, Raymond H., 4,500,289, Cl. 433-54.000.
Martin, Yolanda E.: *See*—
Jacobi, Stephen F.; Haight, Robert E.; Schletzbaum, John W.; Martin, Yolanda E.; and Lang, Stephen P., 4,500,874, Cl. 340-607.000.
Martini, Emilio: *See*—
Credali, Lino; Martini, Emilio; and Lori, Domenico, 4,500,594, Cl. 428-284.000.
Marton, Giulio, to Necchi, Societa per Azioni. Production of machine elements with protection cages connected therewith by means of a single casting operation. 4,499,939, Cl. 164-23.000.
Maruhashi, Yoshitsugu; Kano, Fumio; Yamada, Muneki; and Hirata, Sadao, to Toyo Seikan Kaisha, Ltd. Resin composition excellent in drawability. 4,500,677, Cl. 525-57.000.
Marx, Morris F., III, to AT&T Technologies, Inc. Methods for controlling vinyl plastic extrudate. 4,500,481, Cl. 264-40.600.
Masaki, Kouichi: *See*—
Ogawa, Hiroshi; Mizuno, Chiaki; Masaki, Kouichi; Suzuki, Masaaki; and Tamai, Yasuo, 4,500,599, Cl. 428-336.000.
Maschinenfabrik AD. Schulthess & Co. AG: *See*—
Gasser, Rene , 4,499,621, Cl. 8-158.000.
Masco Corp.: *See*—
Rasor, William, 4,500,020, Cl. 224-321.000.
Masek, Jan: *See*—
Durmis, Julius; Balogh, Alojz; Karvas, Milan; Hrachovcova, Maria; Masek, Jan; Caucik, Pavol; and Povazancova, Marta, 4,500,446, Cl. 252-403.000.
Mason & Hanger-Silas Mason Co., Inc.: *See*—
Martin, Alan B.; and Jackson, Ernest V., 4,499,946, Cl. 166-57.000.
Massachusetts Institute of Technology: *See*—
Schreiber, William F., 4,500,919, Cl. 358-78.000.
Massey-Ferguson Services N.V.: *See*—
Lasoen, Jean J., 4,499,775, Cl. 73-862.570.
Masuda, Akira: *See*—
Miyaki, Masahiko; Masuda, Akira; and Matsumura, Toshimi, 4,499,883, Cl. 123-503.000.
Masuda, Ikuro: *See*—
Sugimoto, Norihiko; Hamada, Nobuhiro; Masuda, Ikuro; and Sakurai, Jinichi, 4,500,951, Cl. 364-186.000.
Masuda, Tsuneaki: *See*—
Shimizu, Senzo; Nomura, Isao; Yamamiya, Kazuo; and Masuda, Tsuneaki, 4,500,668, Cl. 524-427.000.
Masugi, Takashi: *See*—
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, 4,500,709, Cl. 544-58.100.
Masuno, Katsuyoshi: *See*—
Hino, Toshiyuki; and Masuno, Katsuyoshi, 4,499,888, Cl. 123-615.000.
Masuzawa, Sigeaki: *See*—
Hashimoto, Shintaro; Masuzawa, Sigeaki; Shibata, Shinya; Tsuda, Hiroshi; and Nakano, Masahiro, 4,500,211, Cl. 368-63.000.
Maszalec, Judith A. Elastomeric compressible mixture. 4,500,353, Cl. 75-252.000.
Mathis, Ronald D.; Reed, Jerry O.; and Hagler, Gerald E., to Phillips Petroleum Company. Method of producing extrusion grade poly(arylene sulfide). 4,500,706, Cl. 528-502.000.
Matilainen, Jorma: *See*—
Uomala, Vilho; Sandstrom, Kjell; and Matilainen, Jorma, 4,500,092, Cl. 277-12.000.
Matrix Science Corporation: *See*—
Mattingly, William R., Jr.; Johnson, Lyle; and Maher, Tommy B., 4,500,153, Cl. 339-89.00M.
Matsuda, Akira: *See*—
Komoda, Akira; Hirooka, Yasuhiro; Yoshihara, Takahisa; and Matsuda, Akira, 4,500,400, Cl. 204-206.000.
Matsuda, Hiroaki: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 4,500,133, Cl. 297-131.000.
Matsuda, Masanori; Koyama, Haruo; and Miyakawa, Nobuhiro, to Mita Industrial Co., Ltd. Heat-sensitive black recording element. 4,500,897, Cl. 346-209.000.
Matsui, Kiyohide: *See*—
Kondo, Kiyoshi; and Matsui, Kiyohide, 4,500,733, Cl. 562-506.000.
Matsukura, Masayuki; and Fukumura, Yukio, to Nippon Electric Co., Ltd. Frequency modulation transmitter. 4,501,019, Cl. 455-112.000.
Matsumoto, Hiroshi: *See*—
Kita, Nobuyuki; Matsumoto, Hiroshi; and Hagiwara, Hitoshi, 4,500,625, Cl. 430-149.000.
Matsumoto, Ken, to Eli Lilly and Company. 2,4,5-Triaryl pyrimidines and a method of treating pain, fever, thrombosis, inflammation and arthritis. 4,500,533, Cl. 514-256.000.
Matsumoto, Mitsuo: *See*—
Kitamura, Takanori; Matsumoto, Mitsuo; and Tamura, Masuhiko, 4,500,727, Cl. 560-179.000.
Matsumoto, Ryoichiro: *See*—
Akano, Shinichi; Goto, Tsutomu; Watanabe, Hiroshi; Kuroda, Masato; Ishikawa, Sakae; and Matsumoto, Ryoichiro, 4,499,754, Cl. 73-861.120.
Matsumura, Toshimi: *See*—
Miyaki, Masahiko; Masuda, Akira; and Matsumura, Toshimi, 4,499,883, Cl. 123-503.000.
Matsuoka, Fumio; Iijima, Hitoshi; Yamazaki, Kisuke; Kasagi, Hiroshi; Nakashima, Yasuo; Sakuma, Kiyoshi; and Umehara, Mitsuo, to Mitsubishi Denki Kabushiki Kaisha. Control device for refrigeration cycle. 4,499,739, Cl. 62-212.000.
Matsuoka, Naoki: *See*—
Hori, Yutaka; Sunazawa, Makoto; Takayama, Kikuo; Matsuoka, Naoki; and Moroishi, Yutaka, 4,500,683, Cl. 524-533.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Gotou, Makoto; and Okamoto, Hiroshi, 4,500,830, Cl. 323-267.000.
Hotta, Shu; Hosaka, Tomiharu; and Shimotsuma, Wataru, 4,500,459, Cl. 260-396.00N.
Ohta, Yoshio, 4,500,924, Cl. 358-213.000.
Tsuchiya, Tatsuo; and Hozumi, Kazuhiro, 4,500,075, Cl. 267-8.00R.
Matsushita, Yoshiaki: *See*—
Ohmura, Yamichi; and Matsushita, Yoshiaki, 4,500,388, Cl. 156-603.000.
Matsuura, Ikutoshi: *See*—
Hosokawa, Tomoyoshi; Matsuura, Ikutoshi; Takahashi, Hidenori; Ando, Kunio; and Tamura, Gakuzo, 4,500,544, Cl. 514-543.000.
Matt, Timothy S., to Nordson Corporation. Control circuit for a solenoid driver for a dispenser. 4,500,937, Cl. 361-153.000.
Mattel, Inc.: *See*—
Kelley, William J.; and Prince, Terry K., 4,500,299, Cl. 446-230.000.
Matteo, Peter J.: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
Matteucci, Mark D.: *See*—
Caruthers, Marvin H.; and Matteucci, Mark D., 4,500,707, Cl. 536-27.000.

Matth. Hohner AG: *See*—
Deforeit, Christian J., 4,500,317, Cl. 84-1.240.
Matthews, Anthony J.: *See*—
Plank, Vernon G.; Matthews, Anthony J.; Berthel, Robert O.; and LaGross, Dennis L., 4,499,761, Cl. 73-170.00R.
Mattingly, William R., Jr.; Johnson, Lyle; and Maher, Tommy B., to Matrix Science Corporation. Self-locking electrical connector. 4,500,153, Cl. 339-89.00M.
Matyas, Stephen M.: *See*—
Elander, Robert C.; Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Shuck, Robert E.; and Tuchman, Walter L., 4,500,750, Cl. 178-22.080.
Maul Technology Corporation: *See*—
Parkell, Edward; and Newkirk, Mark C., 4,500,334, Cl. 65-334.000.
Maurer, Herman J.; Pedersen, Carl O.; and Nudd, Barry C., to J. I. Case Company. Backhoe swing mechanism. 4,500,250, Cl. 414-695.500.
Mauries, Reinhard: *See*—
Chardon, Manfred; Mauries, Reinhard; Rohner, Joachim; and Zumfeld, Heinz, 4,499,715, Cl. 57-22.000.
Mauser-Werke Oberndorf GmbH: *See*—
Repa, Otto, 4,499,684, Cl. 42-69.00A.
Maxner, Richard B., to USM Corporation. All lead sensor. 4,499,649, Cl. 29-566.300.
Mayer, Andreas; and Niederer, Adolf, to BBC Brown, Boveri & Company, Limited. Pressure wave supercharger with rolling bearings for the rotor. 4,500,260, Cl. 417-64.000.
Mayer, Jean P.; and Wittwer, Fritz, to Warner-Lambert Company. Foam capsules. 4,500,358, Cl. 106-122.000.
Mazeaud, Georges: *See*—
Kervistin, Robert; Lardellier, Alain M. J.; Mazeaud, Georges; and Crozet, Francois E. G., 4,500,143, Cl. 384-467.000.
McCallister, Ronald D.; and Crawford, James J., to Motorola, Inc. Multi-rate branch metric processor for maximum-likelihood convolutional decoder. 4,500,994, Cl. 371-43.000.
McCandless, Harry E., to RCA Corporation. Multibeam electron gun with composite electrode having plurality of separate metal plates. 4,500,808, Cl. 313-409.000.
McClure, John. Device for carrying fishing rods. 4,500,128, Cl. 294-146.000.
McCollum, Gregory J.: *See*—
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; and O'Dwyer, James B., 4,500,680, Cl. 525-143.000.
McConnell, Matthew L.: *See*—
Roberts, Michael K.; Ottosen, Richard A.; and McConnell, Matthew L., 4,499,771, Cl. 73-632.000.
McDonald, Daniel P.; and Wade, James C., to Mississippi Chemical Corporation. Process for removing impurities from wet process of phosphoric acid. 4,500,502, Cl. 423-321.00R.
McDonald, John F.: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T., Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
McDonald, Robert C.; and Macartney, Derek L., to Joy Manufacturing Company. Granular material pneumatic transport apparatus. 4,500,228, Cl. 406-61.000.
McEntyre, Stephen C.: *See*—
Clark, James M.; Secrist, Duane R.; Hardin, Scotty L.; and McEntyre, Stephen C., 4,500,401, Cl. 204-225.000.
McFarland, Keith E.: *See*—
Whitaker, Angus H.; McFarland, Keith E.; Lloyd, William A.; and Patrick, Willard J., 4,500,045, Cl. 242-57.100.
McFarlane, Richard H. Connecting assembly. 4,500,312, Cl. 604-263.000.
McGraw-Edison Company: *See*—
Tuttle, Alan H.; Leonard, James K.; and Dlugosz, Henry J., 4,500,096, Cl. 277-53.000.
McInerny, George P., to Technitrol, Inc. Stripper mechanism for document separating apparatus. 4,500,084, Cl. 271-35.000.
McKean, Peter S.: *See*—
Szczupak, David T.; Walsham, Brian E.; Hooley, Desmond J.; Flaxington, David; McKean, Peter S.; and Wescott, John D., 4,499,732, Cl. 60-602.000.
McKinley, Mark J.; and Sheridan, Dan P., to Dow Chemical Company, The. Composite mixtures for improving gel strength of water absorbent gels. 4,500,670, Cl. 524-445.000.
McKinney, Osborne K.; and Flores, David P., to Dow Chemical Company, The. Stabilized carboxyl-containing ethylene interpolymers. 4,500,664, Cl. 524-119.000.
McKnight, Hugh P.; Welty, Kenneth B.; and Dinius, Harold B., to Eli Lilly and Company. Syringe inspection apparatus. 4,500,247, Cl. 414-416.000.
McLean, Kenneth W., to Sperry Corporation. Deflector panel for disc mower-conditioner. 4,499,711, Cl. 56-13.600.
McMillan, John E., to General Electric Company. Electric lamp with external fuse lead. 4,500,811, Cl. 315-58.000.
McNeil, Roderick J. Apparatus and method for material disposal. 4,499,832, Cl. 110-238.000.
McWhorter, Fred A.; and Bates, William L. Eccentric adjustment for vehicle axle suspensions. 4,500,110, Cl. 280-680.000.
Mead Corporation, The: *See*—
Fishback, Alton J., 4,499,990, Cl. 198-411.000.
Medeiros, Charles W.; and Wagner, James B., to General Electric Company. Control valve test in cam controlled valve system. 4,499,756, Cl. 73-118.000.
Medtronic, Inc.: *See*—
Kallok, Michael J.; and Bornzin, Gene A., 4,499,907, Cl. 128-786.000.
Meehan, James E., to Slater Electric Inc. Self-contained electrical wiring device. 4,500,746, Cl. 174-48.000.
Meeker, Rick A.: *See*—
Bloome, James A.; Meeker, Rick A.; Whicker, Jerry T.; and Foreman, Frederick J., 4,499,624, Cl. 15-97.00R.
Mees, Bernhard: *See*—
Diery, Helmut; and Mees, Bernhard, 4,500,735, Cl. 564-286.000.
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Meier, Willi: *See*—
Meier, Gunter; Meier, Willi; and Hartwig, Jurgen, 4,499,836, Cl. 112-158.00E.
Meinan Machinery Works, Inc.: *See*—
Hasegawa, Katsuji; and Ibuki, Yasuhiro, 4,499,935, Cl. 144-209.00R.
Membrino, Hercules. Pad of plastic bags with support means. 4,500,000, Cl. 206-554.000.
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Swingley, Harold E., Jr., 4,499,997, Cl. 206-509.000.
Mendelson, Mel I.: *See*—
Veltri, Richard D.; Galasso, Francis S.; and Mendelson, Mel I., 4,500,483, Cl. 264-81.000.
Menjo, Hiroshi; and Watanabe, Yoshikazu, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material. 4,500,633, Cl. 430-505.000.
Merck & Co., Inc.: *See*—
Woltersdorf, Otto W., 4,500,538, Cl. 514-367.000.
Wyvratt, Jean M., 4,500,736, Cl. 564-417.000.
Merck Patent Gesellschaft Mit Beschrankter Haftung: *See*—
Hausberg, Hans-Heinrich; Uhl, Jurgen; Seyfried, Christoph; and Minck, Klaus-Otto, 4,500,541, Cl. 514-466.000.
Merlin, Philip. Spool adaptor. 4,500,047, Cl. 242-71.900.
Mermelstein, Seymour: *See*—
Crampton, Arthur W.; Gray, Hollis L., Jr.; and Mermelstein, Seymour, 4,499,773, Cl. 73-718.000.
Merritt, Thomas D.; and Pasichinskyj, Mario J. Linear reciprocating electrical generator. 4,500,827, Cl. 322-3.000.
Metal Box p.l.c.: *See*—
Perigo, John A.; and Divall, John E., 4,499,932, Cl. 141-91.000.
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Simo, Thomas; Eisenlohr, Karl-Heniz; and Puxbaumer, Hans-Hermann, 4,500,415, Cl. 208-56.000.
Meulenbrug, Gerard C., to Nederlandse Industriele Maatschappij NEFIT N.V. Heater and a method of controlling the combustion in such a heater. 4,499,890, Cl. 126-116.00R.
Meussdoerffer, Johann-Nikolaus; Niederprum, Hans; Nieder-Vahrenholz, Hans-Georg; and Bockelmann, Wolfgang, to Bayer Aktiengesellschaft. Disintegration of chromites. 4,500,350, Cl. 75-1.00R.
Meyer, Carl H. W.: *See*—
Elander, Robert C.; Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Shuck, Robert E.; and Tuchman, Walter L., 4,500,750, Cl. 178-22.080.
Meyer, Donald G., to John Fluke Mfg. Co., Inc. Voltage-controlled RF oscillator employing wideband tunable LC resonator. 4,500,854, Cl. 331-117.00R.
Meyer, Louis W., to Dow Chemical Company, The. Compositions containing mold release agents. 4,500,442, Cl. 252-182.000.
Mezak, John A., to Eaton Corporation. Method for enhancing ferromagnetic coupling. 4,500,858, Cl. 333-202.000.
Miale, Joseph N.; and Chang, Clarence D., to Mobil Oil Corporation. Catalysis over activated inorganic oxides. 4,500,418, Cl. 208-114.000.
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Miale, Joseph N.: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,500,421, Cl. 208-116.000.
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Broussoux, Dominique; Facoetti, Hugues; Ravinet, Pierre; Bernard, Daniel; and Micheron, Francois, 4,500,377, Cl. 156-164.000.
Mickiewicz, Stanley, to Codman & Shurtleff, Inc. Electrical transformer. 4,500,832, Cl. 323-340.000.
Microperipheral Corporation: *See*—
Darland, Michael L.; Stoner, Donald L.; Baker, James W., Jr.; and Sponhnholtz, Michael A., 4,500,751, Cl. 179-2.0DP.
Midgley, Charles A.: *See*—
Peltier, Gerard; Longuet, Michel; and Midgley, Charles A., 4,500,591, Cl. 428-251.000.
Midland-Ross Corporation: *See*—
Jumpeter, Alex, 4,499,668, Cl. 34-41.000.
Miggins, Michael R., to Interpace Corporation. Hybrid electrical insulator bushing. 4,500,745, Cl. 174-31.00R.
Mihayashi, Keiji: *See*—
Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; and Karino, Yukio, 4,500,636, Cl. 430-566.000.
Mikami, Eiji: *See*—
Satake, Jiro; Arai, Tetsuzo; Tanaka, Kivokazu; Mikami, Eiji; Moriyasu, Tsuneo; and Nakagawa, Tadasu, 4,500,577, Cl. 428-36.000.

Miki, Masayuki; Suzuki, Seikou; and Sasayama, Takao, to Hitachi, Ltd. Air-fuel ratio controlling apparatus for internal combustion engine. 4,499,880, Cl. 123-489.000.

Mikola, James A., to Ford Motor Company. Replaceable lamp assembly for a sealable reflector housing. 4,500,946, Cl. 362-226.000.

Miles Laboratories, Inc.: *See*—
Brown, Karen K.; and Stewart, Richard C., 4,500,513, Cl. 424-89.000.

Miles, Ronald C.; Geren, George W.; and Peel, R. W., to Olin Corporation. Reference electrode. 4,500,402, Cl. 204-242.000.

Miller, Albert J., to Atlas Electronics International, Inc. Vehicle elapsed mileage indicator. 4,501,005, Cl. 377-20.000.

Miller, Edward A., to RCA Corporation. Distributor tube for CVD reactor. 4,499,853, Cl. 118-725.000.

Miller Hofft, Inc.: *See*—
Haeck, Paul J., 4,499,669, Cl. 34-102.000.

Miller, Hubert A., to AT&T Bell Laboratories. Dial pulse measurement circuitry. 4,501,003, Cl. 375-94.000.

Miller, Jon L. Fluid pressure releasing tool. 4,499,796, Cl. 81-5.10R.

Miller, Richard A., to Westinghouse Electric Corp. Apparatus and process for laser treating sheet material. 4,500,771, Cl. 219-121.0LH.

Miller, Timothy J. E., to General Electric Company. Method of commutation and converter circuit for switched reluctance motors. 4,500,824, Cl. 318-701.000.

Miller, Wiley W.: *See*—
Harris, Stephen K.; and Miller, Wiley W., 4,499,630, Cl. 16-121.000.

Milliken Research Corporation: *See*—
Greenway, John M., 4,499,637, Cl. 26-2.00R.

Millward, Cyril: *See*—
Else, George E.; Millward, Cyril; Dixon, Ronald H. T.; and Jorgensen, Knut, 4,500,352, Cl. 75-130.00B.

Milne, William G.; and Saruwatari, Minoru, to Tundra Holdings Ltd. Emergency escape system. 4,499,966, Cl. 182-3.000.

Minagawa, Motoi, to Takasago Perfumery Co., Ltd. Foam washing method. 4,499,620, Cl. 8-158.000.

Minagawa, Motonobu; Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, to Adeka Argus Chemical Co., Ltd. Light stabilizing N,N,N-tris(2,2,6,6-tetramethyl-4-piperidone ketal)-1,3,5-triazine derivatives and light stabilized synthetic resin compositions. 4,500,663, Cl. 524-101.000.

Minamisawa, Tsuyoshi; Kogo, Yasuo; and Nagata, Yasuhisa, to Toho Belson Co., Ltd. Epoxy resin composition. 4,500,660, Cl. 523-428.000.

Minck, Klaus-Otto: *See*—
Hausberg, Hans-Heinrich; Uhl, Jurgen; Seyfried, Christoph; and Minck, Klaus-Otto, 4,500,541, Cl. 514-466.000.

Ministry of International Trade & Industry: *See*—
Enomoto, Yuji, 4,500,564, Cl. 427-39.000.
Ogura, Mutsuo, 4,500,204, Cl. 356-318.000.

Minnesota Mining and Manufacturing Company: *See*—
Brochman, Wilfred R., 4,500,011, Cl. 220-359.000.
Heinecke, Steven B., 4,499,896, Cl. 128-156.000.
Rametta, Anthony J., 4,500,608, Cl. 428-522.000.
Siedle, Allen R., 4,500,569, Cl. 427-304.000.
Skwor, Edward P., 4,500,025, Cl. 227-19.000.
Whitcomb, David R., 4,500,601, Cl. 428-403.000.

Minolta Camera Kabushiki Kaisha: *See*—
Hanamoto, Hiroyuki; and Horie, Yoshihiro, 4,500,957, Cl. 364-200.000.
Yamanaka, Akira, 4,500,191, Cl. 354-418.000.

Mion, Sergio, to A. Mion S.p.A. Nastrificio. Method and apparatus for cutting woven labels. 4,500,372, Cl. 156-73.300.

Misaka, Yoshiharu; Teraue, Takeshi; and Hatae, Masamiti, to Mitsubishi Chemical Industries, Limited. Process for producing cation exchange resins without swelling during sulphonation process. 4,500,652, Cl. 521-33.000.

Misch, Carl E. Method and apparatus for preparing mucosal tissue for the reception of denture anchoring intramucosal inserts. 4,500,292, Cl. 433-173.000.

Mishuku, Toshio: *See*—
Hayashi, Yutaka; Yamanaka, Mithuyuki; Iida, Hideyo; Shiba, Nobuyasu; Karasawa, Hideyuki; Mishuku, Toshio; and Itou, Atsuo, 4,500,743, Cl. 136-258.000.

Miskiewicz, Leonard A. Removable cap members for pliers. 4,499,798, Cl. 81-423.000.

Misono, Shinji: *See*—
Suzuki, Hiroaki; and Misono, Shinji, 4,500,672, Cl. 524-496.000.

Mississippi Chemical Corporation: *See*—
McDonald, Daniel P.; and Wade, James C., 4,500,502, Cl. 423-321.00R.

Mita Industrial Co., Ltd.: *See*—
Matsuda, Masanori; Koyama, Haruo; and Miyakawa, Nobuhiro, 4,500,897, Cl. 346-209.000.

Mitomi, Takeshi; Yoshimura, Eiji; and Komagata, Hideki, to Boseki Kabushiki Kaisha. Material for protecting human bodies from harmful or poisonous chemical substance. 4,500,581, Cl. 428-85.000.

Mitsubishi Chemical Industries, Limited: *See*—
Misaka, Yoshiharu; Teraue, Takeshi; and Hatae, Masamiti, 4,500,652, Cl. 521-33.000.
Niwa, Toshio; Hihara, Toshio; and Shimizu, Yukiharu, 4,500,455, Cl. 534-635.000.
Niwa, Toshio; and Hihara, Toshio, 4,500,710, Cl. 544-113.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujii, Masao; and Nishiyama, Enju, 4,500,612, Cl. 429-26.000.
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; and Tanaka, Toshinori, 4,500,794, Cl. 290-38.00C.
Hino, Toshiyuki; and Masuno, Katsuyoshi, 4,499,888, Cl. 123-615.000.
Iwata, Toshio, 4,499,877, Cl. 123-425.000.
Katagi, Takashi; and Mano, Seiji, 4,500,882, Cl. 343-372.000.
Kiryu, Yuichi; and Sawada, Tadashi, 4,500,251, Cl. 414-719.000.
Kiyohara, Toyohiko, 4,500,164, Cl. 350-96.100.
Matsuoka, Fumio; Iijima, Hitoshi; Yamazaki, Kisuke; Kasagi, Hiroshi; Nakashima, Yasuo; Sakuma, Kiyoshi; and Umehara, Mitsuo, 4,499,739, Cl. 62-212.000.
Ooga, Hirotomo; and Sakurai, Hiromi, 4,499,657, Cl. 29-578.000.
Tsuji, Shintaro, 4,499,975, Cl. 187-29.00R.
Tsuruta, Keiji; and Tsutsumi, Nagayuki, 4,500,935, Cl. 361-333.000.
Yoshizumi, Toshiaki, 4,500,762, Cl. 200-144.0AP.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Shimizu, Senzo; Nomura, Isao; Yamamiya, Kazuo; and Masuda, Tsuneaki, 4,500,668, Cl. 524-427.000.
Tanaka, Toru; Hataya, Masanori; Tanaka, Kazuo; Sakai, Yukio; and Hamada, Yasufumi, 4,500,730, Cl. 562-416.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Yazaki, Takao; Hattori, Kazuhide; Hattori, Satoru; Hayama, Kazuhide; and Itoh, Isao, 4,500,597, Cl. 428-317.700.

Mitsubishi Yuka Fine Chemicals Co., Ltd.: *See*—
Yazaki, Takao; Hattori, Kazuhide; Hattori, Satoru; Hayama, Kazuhide; and Itoh, Isao, 4,500,597, Cl. 428-317.700.

Mitsui Engineering and Shipbuilding Company Limited: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Itoh, Hayami; Tatsumi, Shuhei; and Takao, Shoichi, 4,500,041, Cl. 241-16.000.

Mitsui Mining Company Ltd.: *See*—
Hamada, Takeshi; and Komatsubara, Yoshinobu, 4,500,501, Cl. 423-239.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,500,719, Cl. 548-522.000.

Mitutoyo Mfg. Co., Ltd.: *See*—
Sakamoto, Hitoshi; Sakagami, Seiji; and Nagashima, Shigeru, 4,500,097, Cl. 277-59.000.

Miyakawa, Nobuhiro: *See*—
Matsuda, Masanori; Koyama, Haruo; and Miyakawa, Nobuhiro, 4,500,897, Cl. 346-209.000.

Miyaki, Masahiko; Masuda, Akira; and Matsumura, Toshimi, to Nippondenso Co., Ltd. Distributor type fuel-injection pump for distributing fuel to cylinders of an internal combustion engine. 4,499,883, Cl. 123-503.000.

Miyanaga, Akiyoshi; and Kurihara, Yukitada, to Toyo Soda Manufacturing Co. Ltd. Separation of analysis of anions. 4,500,431, Cl. 210-656.000.

Miyano, Toshiyuki; and Ohmura, Hideo, to Tokyo Shibuara Denki Kabushiki Kaisha. Bundling apparatus. 4,499,709, Cl. 53-589.000.

Miyasaka, Kojiro: *See*—
Nagamine, Akio; Hayashi, Akira; Yoshida, Kazumasa; and Miyasaka, Kojiro, 4,500,614, Cl. 429-206.000.

Miyatake, Shigehiro: *See*—
Watanabe, Takashi; and Miyatake, Shigehiro, 4,500,914, Cl. 358-44.000.

Mizuno, Chiaki: *See*—
Ogawa, Hiroshi; Mizuno, Chiaki; Masaki, Kouichi; Suzuki, Masaaki; and Tamai, Yasuo, 4,500,599, Cl. 428-336.000.

Mizusawa, Mitutoyo; and Fujisawa, Masao, to Nissin Kogyo Kabushiki Kaisha. Brake oil pressure controlling valve device for vehicles. 4,500,138, Cl. 303-6.00C.

Mobay Chemical Corporation: *See*—
Schmidt, Manfred; Witman, Mark W.; Reinert, Gerard E.; and Lim, In C., 4,500,653, Cl. 521-90.000.

Mobil Oil Corporation: *See*—
Audeh, Costandi A., 4,499,949, Cl. 166-260.000.
Audeh, Costandi A., 4,500,414, Cl. 208-11.00R.
Chang, Clarence D.; and Miale, Joseph N., 4,500,421, Cl. 208-116.000.
Chen, Nai Y.; Haag, Werner O.; Huang, Tracy J.; and Wong, Stephen S., 4,500,417, Cl. 208-111.000.
Miale, Joseph N.; and Chang, Clarence D., 4,500,418, Cl. 208-114.000.
Miale, Joseph N.; and Chang, Clarence D., 4,500,419, Cl. 208-115.000.
Miale, Joseph N.; and Chang, Clarence D., 4,500,420, Cl. 208-116.000.
Miale, Joseph N.; and Chang, Clarence D., 4,500,422, Cl. 208-117.000.
Rankel, Lillian A.; and Valyocsik, Ernest W., 4,500,503, Cl. 423-329.000.

Mochizuki, Taketoshi: *See*—
Kuroda, Shigeaki; Senshu, Takao; Oguni, Kensaku; Mochizuki, Taketoshi; Yasuda, Hiromu; Ishibane, Kyuhei; Atsumi, Akira; Kimura, Hideyuki; and Hatada, Toshio, 4,500,035, Cl. 236-92.00B.

Modic, Frank J., to General Electric Company. Transparent membrane structures. 4,500,584, Cl. 428-145.000.

Mohn, Frank, to Framo Developments (UK) Limited. Electrically driven submersible pump system. 4,500,263, Cl. 417-360.000.

Molat, Joseph H. Changeable circuit controlling switch assembly. 4,500,877, Cl. 340-711.000.

Molin, Alexis, to Atlas Copco Aktiebolag. Apparatus for drilling rock. 4,499,953, Cl. 173-43.000.

Molins, Ltd.: *See*—
Dyett, Derek H.; Wood, Godfrey A.; and Seim, Albert D., II, 4,499,910, Cl. 131-95.000.

Molitor, Edwin A.: *See*—
Madewell, James A.; Molitor, Edwin A.; Crowe, Norman P.; Lampe, Guy W.; and Pavey, Charles F., 4,500,245, Cl. 414-108.000.
Mollgaard, Klaus: *See*—
Kuhn, Franz; Lippek, Wilfried; Mollgaard, Klaus; and Redecker, Friedrich, 4,500,972, Cl. 364-526.000.
Momose, Tsugio: *See*—
Kubo, Kanji; Momose, Tsugio; and Izumi, Chikahiko, 4,500,959, Cl. 364-200.000.
Mondek, Martin J.: *See*—
Hall, Charles B.; and Mondek, Martin J., 4,500,298, Cl. 440-62.000.
Monhardt, Richard J.; Orr, Alfred B.; and Wright, Joseph B., to United Technologies Corporation. Beam for a containment structure. 4,500,252, Cl. 415-9.000.
Monsanto Company: *See*—
DuFour, Daniel L., 4,500,679, Cl. 525-64.000.
King, Christopher J. H., 4,500,403, Cl. 204-255.000.
Montedison S.p.A.: *See*—
Caporiccio, Gerardo; Viola, Gian T.; and Corti, Costante, 4,500,739, Cl. 568-677.000.
Credali, Lino; Martini, Emilio; and Lori, Domenico, 4,500,594, Cl. 428-284.000.
Montesanto, Ernest C., to Ford Aerospace & Communications Corporation. Gravity and temperature compensating reflector support actuator. 4,500,170, Cl. 350-611.000.
Moore, George W.; and Carroll, Robert G., to United States of America, Air Force. Segmented zoned fuel injection system for use with a combustor. 4,499,735, Cl. 60-739.000.
Moran, Thomas M.; and DiBello, Benedict J., to Eaton Corporation. Bolt fastener. 4,500,240, Cl. 411-103.000.
Moreau, Claude. Mechanical device for concealing or displaying printed matter. 4,499,678, Cl. 40-1.600.
Morehouse, Laurence E. Physiological chair. 4,500,137, Cl. 297-458.000.
Morey, William A., to Rockwell International Corporation. Universal instrument flag receiver. 4,500,841, Cl. 328-146.000.
Morgan, David L., to Klipfontein Organic Products Corporation Limited. Production of calcium hypochlorite. 4,500,506, Cl. 423-474.000.
Morghen, Manfred, to General Dynamics Corporation/Convair Div. Removable and replaceable locating pin for locating a workpiece on a sub-plate for machining. 4,500,079, Cl. 269-47.000.
Mori, Chuzo, to Carl Manufacturing Co., Ltd. Punch for office use. 4,499,805, Cl. 83-468.000.
Mori, Haruhisa, to Fujitsu Limited. Laser treating implanted semiconductor surface through photo-resist layer. 4,500,365, Cl 148-1.500.
Mori, Kei. Optical energy collecting and transmitting apparatus using tubular light transmitting element. 4,500,167, Cl. 350-96.320.
Mori, Toshio, to Sony Corporation. Method for the preparation of a pyroelectric material. 4,500,397, Cl. 204-181.00T.
Morimoto, Kiyoshi; and Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Energy conversion element. 4,500,741, Cl. 136-206.000.
Morimoto, Kiyoshi; and Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Iron silicide thermoelectric conversion element. 4,500,742, Cl. 136-206.000.
Morimoto, Yoshiro: *See*—
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Futagi, Masaaki, 4,499,979, Cl. 192-3.310.
Morishima, Norihisa: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, 4,500,342, Cl. 71-93.000.
Morishita, Akira: *See*—
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; and Tanaka, Toshinori, 4,500,794, Cl. 290-38.00C.
Morita, Keiichi: *See*—
Onuki, Jin; Soeno, Ko; Morita, Keiichi; and Onodera, Hisakithi, 4,500,904, Cl. 357-67.000.
Moriyasu, Tsuneo: *See*—
Satake, Jiro; Arai, Tetsuzo; Tanaka, Kivokazu; Mikami, Eiji; Moriyasu, Tsuneo; and Nakagawa, Tadasu, 4,500,577, Cl. 428-36.000.
Morizumi, Masaaki; Kando, Toru; and Haraguchi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electronic flash camera. 4,500,184, Cl. 354-149.110.
Morningstar, LeRoy J.: *See*—
Huffnagle, Clifton W.; and Morningstar, LeRoy J., 4,500,157, Cl. 339-97.00R.
Morofuji, Akihiko: *See*—
Taira, Kazuo; Morofuji, Akihiko; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,500,575, Cl. 428-35.000.
Moroi, Shirou: *See*—
Kita, Yasushi; Moroi, Shirou; Sakanoue, Akira; and Nakano, Hisaji, 4,500,678, Cl. 252-58.000.
Moroishi, Yutaka: *See*—
Hori, Yutaka; Sunakawa, Makoto; Takayama, Kikuo; Matsuoka, Naoki; and Moroishi, Yutaka, 4,500,683, Cl. 524-533.000.
Morr, Gary F.; and Duncan, William A., to United States of America, Army. Chemical pump with integral diffuser. 4,500,997, Cl. 372-58.000.
Morris Rod-Weeder Co. Ltd.: *See*—
Machnee, Cecil B., 4,500,017, Cl. 222-288.000.
Machnee, Cecil B., 4,500,105, Cl. 280-468.000.
Morris, Wilford V.: *See*—
Radtke, Robert P.; and Morris, Wilford V., 4,499,958, Cl. 175-329.000.
Morzsic, Piotr A.: *See*—
Zsoka, Istvan; Madar, Laszlo ; Cubin, Anatoly A.; Gaivoronsky, Albert A.; Farukshin, Lev H.; Morzsic, Piotr A.; Lisov, Aleksandr I.; and Galusztainc, Vladilen A., 4,499,947, Cl. 166-179.000.
Moser, Peter, to BBC Brown, Boveri & Company, Limited. Controllable exhaust gas turbocharger. 4,499,731, Cl. 60-602.000.
Moser, Winfried: *See*—
Linder, Ernst; Moser, Winfried; and Rieger, Franz, 4,499,867, Cl. 123-145.00A.
Moss, Ronald W.: *See*—
Patten, James W.; Moss, Ronald W.; and Forcht, Brennan A., 4,500,602, Cl. 428-408.000.
Mostek Corporation: *See*—
Shrivastava, Rituparna, 4,499,652, Cl. 29-571.000.
Motoren-Und Turbinen-Union Munchen GmbH: *See*—
Huther, Werner, 4,500,482, Cl. 264-65.000.
Motorola, Inc.: *See*—
Akram, M. Faheem, 4,500,831, Cl. 323-315.000.
Engles, Bruce E., 4,500,961, Cl. 364-200.000.
Gomersall, Earl R.; and Cipolla, Arthur F., 4,500,880, Cl. 340-825.350.
Higgins, Mary L.; and Muri, David L., 4,501,017, Cl. 455-78.000.
McCallister, Ronald D.; and Crawford, James J., 4,500,994, Cl. 371-43.000.
Shanley, Charles W.; and Braun, William V., 4,501,018, Cl. 455-83.000.
Motoyama, Takeshi; Onishi, Toshiyuki; and Yokoyama, Kunio, to Tokyo Shibaura Denki Kabushiki Kaisha. Control device for a refrigerator. 4,499,738, Cl. 62-155.000.
Moutou, Paul: *See*—
Hareng, Michel; and Moutou, Paul, 4,500,878, Cl. 340-713.000.
Muenzebrock, Anton: *See*—
Hasselmann, Heinz; and Muenzebrock, Anton, 4,500,969, Cl. 364-508.000.
Mukamal, Harold: *See*—
Ashlock, L. T.; Mukamal, Harold; and White, William H., 4,500,669, Cl. 524-440.000.
Mukunoki, Yasuo: *See*—
Takahashi, Osamu; Yamamura, Nobuo; Mukunoki, Yasuo; Ogawa, Shungi; and Nakagawa, Yutaka, 4,500,362, Cl. 106-309.000.
Muller, Hans, to DrM, Dr. Muller AG. Method and apparatus for cleaning pressure filters. 4,500,435, Cl. 210-798.000.
Muller, Rolf: *See*—
Backe, Egbert; Muller, Rolf; Otto, Dieter; Leonardi, Cornelio; Kochendorfer, Heinrich; Fussner, Paul; Walker, Ewald; and Rommel, Rudi, 4,499,757, Cl. 73-119.00A.
Multifold-International, Inc.: *See*—
Madewell, James A.; Molitor, Edwin A.; Crowe, Norman P.; Lampe, Guy W.; and Pavey, Charles F., 4,500,245, Cl. 414-108.000.
Multimatic Maschinen GmbH & Co.: *See*—
Kotter, Gustav; and Mutschlknaus, Peter, 4,499,744, Cl. 68-210.000.
Mumford, Eustace H., to Owens-Illinois, Inc. Multiple gob shearing mechanism operating in a straight line. 4,499,806, Cl. 83-527.000.
Murai, Masataka: *See*—
Ishii, Kiyoshi; Murai, Masataka; and Yonekawa, Hitoshi, 4,500,426, Cl. 210-321.300.
Murakami, Toshio: *See*—
Hanma, Kentaro; Murakami, Toshio; and Todaka, Yoshihiro, 4,500,925, Cl. 358-227.000.
Murakami, Yasushi: *See*—
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.
Muraoka, Yasuhiko: *See*—
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,500,452, Cl. 260-112.50R.
Muri, David L.: *See*—
Higgins, Mary L.; and Muri, David L., 4,501,017, Cl. 455-78.000.
Murphy, Charles J., to Sperry Corporation. Convergence control apparatus for color cathode ray tube display systems. 4,500,816, Cl. 315-368.000.
Murphy, Randall T.; and Heling, Dennis, to Lear Siegler, Inc. Vehicle seat including improved adjustable side bolsters. 4,500,136, Cl. 297-284.000.
Murphy, Richard D.; Perez, Ricardo L.; and Clelford, Douglas H., to United Technologies Corporation. Aircraft short-term roll attitude retention system. 4,500,967, Cl. 364-434.000.
Murto, Tapio H., to Northern Telecom Limited. Electric hybrid circuits. 4,500,755, Cl. 179-170.0NC.
Musaev, Irsali K.: *See*—
Eschenko, Vladislav Y.; Musaev, Irsali K.; Talibdzhanov, Zakhidzhan S.; Leonov, Viktor A.; Bobrov, Anatoly D.; Kirovsky, Efim I.; Gritsenko, Vladimir A.; and Golovanov, Alexandr V., 4,500,282, Cl. 431-184.000.
Musashi Co., Ltd.: *See*—
Koshio, Yoshihiro; Kato, Tadao; and Kawano, Hikaru, 4,500,002, Cl. 209-534.000.
Mutschlknaus, Peter: *See*—
Kotter, Gustav; and Mutschlknaus, Peter, 4,499,744, Cl. 68-210.000.
N P S P "Novotex": *See*—
Dimitrov, Milko D., 4,499,717, Cl. 57-297.000.

Nabisco Brands, Inc.: *See*—
Puglia, Wayne J.; Kehoe, Gary S.; and Clark, K. Warren, 4,500,547, Cl. 426-3.000.

Nabulsi, Hazem, to Panavision, Inc. Automatic on-air registration system and method for color TV camera. 4,500,916, Cl. 358-51.000.

Nagai, Hideaki: *See*—
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.

Nagai, Hiroshi, to Nippon Furnace Kogyo Co., Ltd.; and Chichibu Cement Co. Ltd. Primary air supply unit of rotary kiln. 4,500,286, Cl. 432-106.000.

Nagami, Akira, to Nippon Electric Co., Ltd. Memory circuit. 4,500,974, Cl. 365-222.000.

Nagamine, Akio; Hayashi, Akira; Yoshida, Kazumasa; and Miyasaka, Kojiro, to Toshiba Battery Co., Ltd. Alkaline cell. 4,500,614, Cl. 429-206.000.

Nagano, Takahiro: *See*—
Yatsuo, Tsutomu; Nagano, Takahiro; Oikawa, Saburo; and Horie, Akira, 4,500,903, Cl. 357-38.000.

Nagano, Tamio, to Kabushiki Kaisha Daikin Seisakusho. Damper disc with concentric springs including hourglass-shaped springs to reduce the effect of centrifugal forces. 4,499,981, Cl. 192-106.200.

Nagao, Kimitoshi: *See*—
Sakanoue, Kei; Yagihara, Morio; Ichijima, Seigi; and Nagao, Kimitoshi, 4,500,634, Cl. 430-544.000.

Nagao, Nobuya: *See*—
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,500,931, Cl. 358-310.000.

Nagashima, Shigeru: *See*—
Sakamoto, Hitoshi; Sakagami, Seiji; and Nagashima, Shigeru, 4,500,097, Cl. 277-59.000.

Nagata, Masayoshi: *See*—
Horie, Seiji; Nakano, Junji; Nagata, Masayoshi; and Sato, Hideo, 4,500,622, Cl. 430-78.000.

Nagata, Yasuhisa: *See*—
Minamisawa, Tsuyoshi; Kogo, Yasuo; and Nagata, Yasuhisa, 4,500,660, Cl. 523-428.000.

Nagata, Yukiaki: *See*—
Sugino, Kenji; and Nagata, Yukiaki, 4,500,262, Cl. 417-214.000.

Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; Sato, Kozo; and Fujita, Shinsaku, to Fuji Photo Film Co., Ltd. Heat-developable color photographic material. 4,500,626, Cl. 430-203.000.

Naito, Hideki; and Yabuki, Yoshiharu, to Fuji Photo Film Co., Ltd. Heat developement of silver halide element with redox dye releaser and fog reducer. 4,500,627, Cl. 430-203.000.

Naito, Hideki: *See*—
Aono, Toshiaki; Hara, Hiroshi; and Naito, Hideki, 4,500,624, Cl. 430-138.000.

Naito, Shotaro: *See*—
Noto, Yasuo; Naito, Shotaro; and Ohmae, Tsutomu, 4,500,820, Cl. 318-139.000.

Naito, Takayuki: *See*—
Imae, Kiyoto; Aburaki, Shimpei; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, 4,500,526, Cl. 514-226.000.

Nakagawa, Junkichi: *See*—
Kajioka, Hiroshi; Tokunaga, Toshihide; and Nakagawa, Junkichi, 4,500,168, Cl. 350-96.340.

Nakagawa, Katsumi: *See*—
Nakane, Takeshi; and Nakagawa, Katsumi, 4,500,864, Cl. 338-4.000.

Nakagawa, Tadasu: *See*—
Satake, Jiro; Arai, Tetsuzo; Tanaka, Kivokazu; Mikami, Eiji; Moriyasu, Tsuneo; and Nakagawa, Tadasu, 4,500,577, Cl. 428-36.000.

Nakagawa, Taizo: *See*—
Yoshida, Hiroshi; Koike, Kengo; Shimano, Shizuo; Nakagawa, Taizo; and Ohmori, Kaoru, 4,500,536, Cl. 514-397.000.

Nakagawa, Yohichi: *See*—
Takehara, Hidetoshi; Shioji, Shorbu; and Nakagawa, Yohichi, 4,500,693, Cl. 526-240.000.

Nakagawa, Yutaka: *See*—
Takahashi, Osamu; Yamamura, Nobuo; Mukunoki, Yasuo; Ogawa, Shungi; and Nakagawa, Yutaka, 4,500,362, Cl. 106-309.000.

Nakajima Dokosho Company Limited: *See*—
Nakajima, Masahiko, 4,500,027, Cl. 228-54.000.

Nakajima, Kenji: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Inai, Yuichi; Kohara, Yoshiyuki; Kawakami, Yoshiyuki; and Tsurugi, Tomio, 4,500,463, Cl. 260-406.000.

Nakajima, Masahiko, to Nakajima Dokosho Company Limited. Method of manufacturing soldering tips. 4,500,027, Cl. 228-54.000.

Nakajima, Mikio: *See*—
Kanda, Mutsumi; Nakanishi, Kiyoshi; Inoue, Tokuta; and Nakajima, Mikio, 4,499,868, Cl. 123-188.00M.

Nakamura, Masashi, to Nissan Motor Company, Limited. Method of producing electrode for liquid fuel cell. 4,500,395, Cl. 204-284.000.

Nakamura, Norihiko: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,500,476, Cl. 261-44.00C.

Nakane, Takeshi; and Nakagawa, Katsumi, to Aisin Seiki Kabushiki Kaisha. Pressure sensor. 4,500,864, Cl. 338-4.000.

Nakanishi, Hirotoshi: *See*—
Yamachika, Hiroshi; and Nakanishi, Hirotoshi, 4,500,721, Cl. 549-362.000.

Nakanishi, Kiyoshi: *See*—
Kanda, Mutsumi; Nakanishi, Kiyoshi; Inoue, Tokuta; and Nakajima, Mikio, 4,499,868, Cl. 123-188.00M.

Nakanishi, Koichiro; and Hiratani, Hajime, to Japan Chemical Research Co., Ltd. Process for preparing a heat-stable aqueous solution of human urine kallikrein and product prepared. 4,500,514, Cl. 424-94.000.

Nakano, Eiichi: *See*—
Sando, Yoshikazu; Nakano, Eiichi; and Ishidoshiro, Hiroshi, 4,500,318, Cl. 8-111.000.

Nakano, Hideki: *See*—
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.

Nakano, Hisaji: *See*—
Kita, Yasushi; Moroi, Shirou; Sakanoue, Akira; and Nakano, Hisaji, 4,500,678, Cl. 252-58.000.

Nakano, Junji: *See*—
Horie, Seiji; Nakano, Junji; Nagata, Masayoshi; and Sato, Hideo, 4,500,622, Cl. 430-78.000.

Nakano, Kenji: *See*—
Tajima, Shigeru; Okada, Hiroshi; and Nakano, Kenji, 4,500,822, Cl. 318-314.000.

Nakano, Masahiro: *See*—
Hashimoto, Shintaro; Masuzawa, Sigeaki; Shibata, Shinya; Tsuda, Hiroshi; and Nakano, Masahiro, 4,500,211, Cl. 368-63.000.

Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co., Ltd. Baby chair. 4,500,133, Cl. 297-131.000.

Nakao, Sho: *See*—
Shiba, Keisuke; Yazawa, Hiromi; Ohishi, Chikashi; and Nakao, Sho, 4,500,618, Cl. 430-49.000.

Nakaoji, Kazuhiko; Kamao, Mitsugu; Itoh, Hayami; Tatsumi, Shuhei; and Takao, Shoichi, to Lion Corporation; Kao Corporation; Mitsui Engineering and Shipbuilding Company Limited; Electric Power Development Company Limited; and Kawasaki Jukogyo Kabushiki Kaisha. Process for producing high-concentration slurry of coal. 4,500,041, Cl. 241-16.000.

Nakashima, Yasuo: *See*—
Matsuoka, Fumio; Iijima, Hitoshi; Yamazaki, Kisuke; Kasagi, Hiroshi; Nakashima, Yasuo; Sakuma, Kiyoshi; and Umehara, Mitsuo, 4,499,739, Cl. 62-212.000.

Nakatani, Tokuji: *See*—
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,500,452, Cl. 260-112.50R.

Nakatsuji, Fumio: *See*—
Ishitobi, Yoshimitsu; Fujii, Kouhei; and Nakatsuji, Fumio, 4,500,867, Cl. 338-128.000.

Nakayama, Kazuaki, to Pioneoer Electronic Corporation. Low noise power amplifier circuit. 4,500,849, Cl. 330-300.000.

Nakayama, Takao, to Fuji Photo Film Co., Ltd. Method for preparing a lithographic printing plate and a light-sensitive material used therefor. 4,500,617, Cl. 430-49.000.

Nakazawa, Hayashi: *See*—
Tsuboi, Nobuyoshi; Shima, Seiya; Kanasaki, Morio; and Nakazawa, Hayashi, 4,499,986, Cl. 198-322.000.

Nakazima, Shigeko. Display panel and process for forming pattern therefor. 4,500,374, Cl. 156-83.000.

Napp, Gerhard; Bieringer, Ulrich; Kreismer, Heinz; and Goseberg, Walter, to Licentia Patent-Verwaltungs-G.m.b.H. Switched mode power supply transformer. 4,500,833, Cl. 323-359.000.

Narita, Kazuo: *See*—
Taya, Akira; Narita, Kazuo; Asada, Masao; and Kimura, Yoshio, 4,500,443, Cl. 252-301.40P.

Narita, Yukio: *See*—
Imae, Kiyoto; Aburaki, Shimpei; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, 4,500,526, Cl. 514-226.000.

Nasser, William E.: *See*—
Woods, John H.; Graves, Toby R.; Nasser, William E.; and Jagtap, Ashvinkumar N., 4,500,359, Cl. 106-270.000.

Nathanielsz, to Cornell Research Foundation, Inc. Suppression of premature labor by use of aromatase inhibitors. 4,500,523, Cl. 514-178.000.

National Research Development Corporation: *See*—
Klinner, Wilfred E., 4,499,712, Cl. 56-16.400.
Perry, Forbes G. D., 4,499,782, Cl. 74-200.000.
Rowley, Alan G.; and Husband, Fiona M., 4,500,497, Cl. 423-89.000.

Naubereit, Henry; Beyer, Henry R.; DeSipio, Richard G.; and Picard, Salvatore R., to United States of America, Navy. Data link timing. 4,500,884, Cl. 343-456.000.

Naubereit, Henry; Long, Thomas F.; Picard, Salvatore R.; and Ritz, Joseph, to United States of America, Navy. Data link shift register operation. 4,500,886, Cl. 343-456.000.

Naul, George M., to Owens-Corning Fiberglas Corporation. Honeycomb structure. 4,500,583, Cl. 428-116.000.

Nautilus Sports/Medical Industries, Inc.: *See*—
Jones, Arthur A., 4,500,089, Cl. 272-117.000.

NEC Corporation: *See*—
Akashi, Fumio, 4,500,990, Cl. 370-85.000.

NEC Kansai, Ltd.: *See*—
Ishitobi, Yoshimitsu; Fujii, Kouhei; and Nakatsuji, Fumio, 4,500,867, Cl. 338-128.000.

Necchi, Societa per Azioni: *See*—
Marton, Giulio, 4,499,939, Cl. 164-23.000.

Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek: *See—*
Le Poole, Jan B.; and Kruit, Pieter, 4,500,787, Cl. 250-427.000.
van den Engh, Gerrit J.; Trask, Barbara J.; and Visser, Johannes W. M., 4,500,641, Cl. 435-291.000.
Nederlandse Industriele Maatschappij NEFIT N.V.: *See—*
Meulenbrug, Gerard C., 4,499,890, Cl. 126-116.00R.
Neitz, Alfred; D'Alfonso, Nunzio; and Pickel, Hans, to M.A.N. Maschinenfabrik Ausburg-Nurnberg AG. Fuel injection method and arrangement for direct-injection internal combustion engines. 4,499,871, Cl. 123-276.000.
Nelson, Delmer R., to A. O. Smith Harvestore Products, Inc. Breather bag construction for a sealed storage structure. 4,499,820, Cl. 99-646.00S.
Nelson, Victor H. Sector motor having latching means for rotor in multiple positions. 4,500,861, Cl. 335-253.000.
Nester, William H., to General Electric Company. Microstrip notch antenna. 4,500,887, Cl. 343-700.0MS.
Neumaier, Hermann: *See—*
Hausmann, Heinz; Niessen, Heinz J.; Telle, Otto; and Neumaier, Hermann, 4,500,348, Cl. 71-103.000.
Neville, David M., Jr.; and Youle, Richard J., to United States of America, Health and Human Services. Prevention of graft versus host disease following bone marrow transplantation. 4,500,637, Cl. 435-2.000.
New Hermes Incorporated: *See—*
Plotkin, Victor, 4,500,236, Cl. 409-86.000.
New Nippon Electric Co., Ltd.: *See—*
Katayama, Hiroomi; Hirosawa, Yoshiaki; and Fujii, Masahiko, 4,499,875, Cl. 123-416.000.
New York University: *See—*
Abele, Manlio, 4,501,009, Cl. 378-19.000.
Newkirk, Mark C.: *See—*
Parkell, Edward; and Newkirk, Mark C., 4,500,334, Cl. 65-334.000.
Nguyen, Khoi B., to Schlumberger Technology Corporation. Electrical connector. 4,500,156, Cl. 339-94.00C.
Nguyen, Lan N.: *See—*
Shimbo, Osamu; Nguyen, Lan N.; and Dicks, Jack L., 4,500,984, Cl. 370-6.000.
Nguyen, Tac H.; and Husson, Alan L., to Westinghouse Electric Corp. Terminal slowdown speed pattern generator. 4,499,974, Cl. 187-29.00R.
Nicholas, Rodney G., to Nicolet Instrument Corporation. Graphic recording system. 4,500,890, Cl. 346-29.000.
Nichols, Gary A.: *See—*
Stoltman, Donald D.; and Nichols, Gary A., 4,499,879, Cl. 123-480.000.
Nicholson, Myron D.; and Chiu, Herman; S., to Union Carbide Corporation. Inhibition of discoloration on cellulose food casings. 4,500,576, Cl. 428-36.000.
Nickerson, Mark A.: *See—*
Poole, John S.; Gere, Dennis R.; Bell, Raymond J.; and Nickerson, Mark A., 4,500,432, Cl. 210-659.000.
Nickisch, Klaus; Bittler, Dieter; Laurent, Henry; Wiechert, Rudolf; and Losert, Wolfgang, to Schering Aktiengesellschaft. 7α-Acylthio-15,16-methylene-3-oxo-17α-pregna-1,4-diene-21,17-carbolactones, their preparation and use as medicinal agents. 4,500,522, Cl. 514-173.000.
Nickle, Allen F., to International Business Machines Corporation. Dialog user error diagnosis, severity, and help technique. 4,500,964, Cl. 364-300.000.
Nickol, Friedrich W.; and Baeger, Holm, to VDO Adolf Schindling AG. Solderable layer system. 4,500,611, Cl. 428-686.000.
Nicolet Instrument Corporation: *See—*
Nicholas, Rodney G., 4,500,890, Cl. 346-29.000.
Schumann, Robert W., 4,500,182, Cl. 354-4.000.
Nicoll, Andrew R., to BBC Aktiengesellschaft Brown, Boveri & Cie. High temperature protective coating alloy. 4,500,489, Cl. 420-445.000.
Nicolon Corporation: *See—*
Scales, Michael J., 4,499,664, Cl. 29-714.000.
Nieder-Vahrenholz, Hans-Georg: *See—*
Meussdoerffer, Johann-Nikolaus; Niederprum, Hans; Nieder-Vahrenholz, Hans-Georg; and Bockelmann, Wolfgang, 4,500,350, Cl. 75-1.00R.
Niederer, Adolf: *See—*
Mayer, Andreas; and Niederer, Adolf, 4,500,260, Cl. 417-64.000.
Niederprum, Hans: *See—*
Meussdoerffer, Johann-Nikolaus; Niederprum, Hans; Nieder-Vahrenholz, Hans-Georg; and Bockelmann, Wolfgang, 4,500,350, Cl. 75-1.00R.
Niehaus, Frederick D. Combine concave structure. 4,499,908, Cl. 130-27.00K.
Nielsen Moulding Design Corporation: *See—*
Sherman, Charles F., 4,499,679, Cl. 40-152.100.
Niessen, Heinz J.: *See—*
Hausmann, Heinz; Niessen, Heinz J.; Telle, Otto; and Neumaier, Hermann, 4,500,348, Cl. 71-103.000.
Nieto, Antoliano. Polyhedral puzzle. 4,500,090, Cl. 273-153.00S.
Nifco Inc.: *See—*
Tanaka, Toshie, 4,499,636, Cl. 24-289.000.
Nigorikawa, Shigeru: *See—*
Ohyama, Tohru; and Nigorikawa, Shigeru, 4,500,920, Cl. 358-139.000.
Nigro, Louis V., to Gillette Company, The. Holder. 4,500,061, Cl. 248-359.001.
Nihei, Mitsuo; and Nishi, Hidetoshi, to Hitachi, Ltd. Rolling mill. 4,499,748, Cl. 72-238.000.
Nihon Tokushu Noyaku Seizo K.K.: *See—*
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, 4,500,342, Cl. 71-93.000.
Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; and Kamochi, Atsumi, 4,500,346, Cl. 71-94.000.
Nijboer, Jakob G.: *See—*
Immink, Kornelis A.; Nijboer, Jakob G.; Ogawa, Hiroshi; and Odaka, Kentaro, 4,501,000, Cl. 375-25.000.
Nikitin, Yaroslav G.: *See—*
Sidorenko, Georgy I.; Lopato, Georgy P.; Yakubovich, Vladimir M.; Nikitin, Yaroslav G.; Usachev, Oleg I.; and Vorobiev, Anatoly P., 4,499,904, Cl. 128-703.000.
Niles Parts Company, Limited: *See—*
Honjo, Kazumi, 4,500,774, Cl. 219-265.000.
Nilsson, Goran A. Collapsible bow saw. 4,499,936, Cl. 145-33.00E.
Ninomiya, Yuichi; and Ohtsuka, Yoshimichi, to Nippon Hoso Kyokai. Noise reduction apparatus. 4,500,911, Cl. 358-36.000.
Nippon Air Brake Co., Ltd.: *See—*
Kubota, Hitoshi; Hamamatsu, Seiji; Yambe, Teluo; and Takahashi, Toshiyuki, 4,500,761, Cl. 200-84.00C.
Nippon Electric Co., Ltd.: *See—*
Hasegawa, Satoshi, 4,500,987, Cl. 370-60.000.
Matsukura, Masayuki; and Fukumura, Yukio, 4,501,019, Cl. 455-112.000.
Nagami, Akira, 4,500,974, Cl. 365-222.000.
Yoshida, Yasuharu; Seguchi, Hiroshi; and Tagashira, Yoshimi, 4,501,004, Cl. 375-102.000.
Nippon Furnace Kogyo Co., Ltd.: *See—*
Nagai, Hiroshi, 4,500,286, Cl. 432-106.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Aoki, Eiichiro, 4,499,808, Cl. 84-1.030.
Nippon Hoso Kyokai: *See—*
Ninomiya, Yuichi; and Ohtsuka, Yoshimichi, 4,500,911, Cl. 358-36.000.
Nippon Kayaku Kabushiki Kaisha: *See—*
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,500,452, Cl. 260-112.50R.
Yoshida, Hiroshi; Koike, Kengo; Shimano, Shizuo; Nakagawa, Taizo; and Ohmori, Kaoru, 4,500,536, Cl. 514-397.000.
Nippon Kogaku K.K.: *See—*
Kusaka, Yosuke; and Fukuhara, Toru, 4,500,778, Cl. 250-204.000.
Nippon Paint Kabushiki Kaisha: *See—*
Satake, Jiro; Arai, Tetsuzo; Tanaka, Kivokazu; Mikami, Eiji; Moriyasu, Tsuneo; and Nakagawa, Tadasu, 4,500,577, Cl. 428-36.000.
Nippon Piston Ring Co., Ltd.: *See—*
Ikutake, Hiroshi, 4,499,643, Cl. 29-156.600.
Nippon Sheet Glass Co., Ltd.: *See—*
Kato, Yukihiro; Kawahara, Hideo; and Hyohdou, Masato, 4,500,567, Cl. 427-255.300.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Takehara, Hidetoshi; Shioji, Shorbu; and Nakagawa, Yohichi, 4,500,693, Cl. 526-240.000.
Nippon Soken, Inc.: *See—*
Fukami, Akira; Noguchi, Hiroki; and Hamaguchi, Hiroshi, 4,500,479, Cl. 261-98.000.
Igashira, Toshihiko; Tanaka, Taro; and Sakakibara, Yasuyuki, 4,499,878, Cl. 123-478.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Nogami, Susumu; and Suzuki, Yukio, 4,499,882, Cl. 123-492.000.
Wakayama, Masao; Takemura, Makoto; and Kasagi, Takao, 4,500,360, Cl. 106-286.500.
Nippon Steel Corporation: *See—*
Kokai, Katsuaki; and Ohta, Takeo, 4,500,366, Cl. 148-111.000.
Nippondenso Co., Ltd.: *See—*
Kanayama, Kenji; and Sugi, Hidekuni, 4,500,806, Cl. 310-198.000.
Miyaki, Masahiko; Masuda, Akira; and Matsumura, Toshimi, 4,499,883, Cl. 123-503.000.
Sangu, Osamu; and Hotta, Seiko, 4,500,775, Cl. 219-497.000.
Takao, Mitsunori, 4,499,881, Cl. 123-492.000.
Tokitsu, Naoki; Fujiwara, Toshitaka; Kato, Toranosuke; and Uno, Toshihiko, 4,500,868, Cl. 340-52.00F.
Yamamoto, Yoshihisa, 4,499,876, Cl. 123-446.000.
Nisenson, Jules: *See—*
Waine, Martin; Rude, Edward T.; and Nisenson, Jules, 4,499,937, Cl. 160-41.000.
Nishazawa, Kimocjo: *See—*
Nishizawa, Junichi; Suzuki, Soubei; and Tamamushi, Takashige, 4,499,654, Cl. 29-571.000.
Nishi, Hidetoshi: *See—*
Nihei, Mitsuo; and Nishi, Hidetoshi, 4,499,748, Cl. 72-238.000.
Nishiguchi, Akira; Usui, Sanpei; Oouchi, Tomihisa; and Iwai, Kazumi, to Hitachi, Ltd. Vapor generator. 4,499,859, Cl. 122-18.000.
Nishihara, Teruyoshi, to Nissan Motor Company, Limited. AC Generator. 4,500,828, Cl. 322-46.000.
Nishikawa, Yoshikawzu, to Toho-Polymer Kabushika Kaisha. Keyboard key with embedded top character. 4,500,218, Cl. 400-490.000.
Nishimoto, Ikuo, to Honeywell Inc. Alternating polarity power supply control apparatus. 4,500,797, Cl. 307-296.00R.
Nishino, Hiroshi; Aibe, Toshio; and Noguchi, Katsuya, to Takeda Chemical Industries, Ltd. Process for removal of mercury vapor and adsorbent therefor. 4,500,327, Cl. 55-72.000.

Nishio, Tadashi: *See—*
Kasuga, Muneo; Shimizu, Akira; and Nishio, Tadashi, 4,500,199, Cl. 355-14.0CU.
Nishiyama, Enju: *See—*
Fujii, Masao; and Nishiyama, Enju, 4,500,612, Cl. 429-26.000.
Nishizawa, Junichi; Suzuki, Soubei; and Tamamushi, Takashige, to Nishazawa, Kimocjo. Method for fabricating semiconductor photodetector. 4,499,654, Cl. 29-571.000.
Nissan Motor Company, Limited: *See—*
Aoyama, Shunichi, 4,499,870, Cl. 123-198.00F.
Hirano, Yoshinori, 4,499,866, Cl. 123-41.210.
Kishi, Norimasa; and Noso, Kazunori, 4,501,012, Cl. 381-43.000.
Kubota, Hitoshi; Hamamatsu, Seiji; Yambe, Teluo; and Takahashi, Toshiyuki, 4,500,761, Cl. 200-84.00C.
Nakamura, Masashi, 4,500,395, Cl. 204-284.000.
Nishihara, Teruyoshi, 4,500,828, Cl. 322-46.000.
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Futagi, Masaaki, 4,499,979, Cl. 192-3.310.
Nisshin Flour Milling Co., Ltd.: *See—*
Tanaka, Kenji; and Endo, Shigeru, 4,500,551, Cl. 426-62.000.
Nissin Kogyo Kabushiki Kaisha: *See—*
Kasahara, Hiroshi, 4,499,730, Cl. 60-585.000.
Mizusawa, Mitutoyo; and Fujisawa, Masao, 4,500,138, Cl. 303-6.00C.
Nitto Electric Industrial Co., Ltd.: *See—*
Hori, Yutaka; Sunakawa, Makoto; Takayama, Kikuo; Matsuoka, Naoki; and Moroishi, Yutaka, 4,500,683, Cl. 524-533.000.
Niwa, Toshio; Hihara, Toshio; and Shimizu, Yukiharu, to Mitsubishi Chemical Industries, Limited. Reactive disperse diaminopyridine azo dyes containing a fluorostriazine group. 4,500,455, Cl. 534-635.000.
Niwa, Toshio; and Hihara, Toshio, to Mitsubishi Chemical Industries, Limited. Quinophthalone dyes for cellulose-containing fibers. 4,500,710, Cl. 544-113.000.
Nixdorf Computer AG: *See—*
Lubcke, Hartmut; and Backhaus, Martin, 4,500,991, Cl. 370-88.000.
Nogami, Susumu: *See—*
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Nogami, Susumu; and Suzuki, Yukio, 4,499,882, Cl. 123-492.000.
Noguchi, Hiroki: *See—*
Fukami, Akira; Noguchi, Hiroki; and Hamaguchi, Hiroshi, 4,500,479, Cl. 261-98.000.
Noguchi, Katsuya: *See—*
Nishino, Hiroshi; Aibe, Toshio; and Noguchi, Katsuya, 4,500,327, Cl. 55-72.000.
Nolan, James D. Apparatus for coating the glass envelope and predetermined portions of the end caps of a fluorescent lamp. 4,499,850, Cl. 118-406.000.
Nolan, Kenneth P.: *See—*
Duke, Alan H.; Hartung, Michael H.; Marschner, Frederick J.; and Nolan, Kenneth P., 4,500,954, Cl. 364-200.000.
Nomura, Isao: *See—*
Shimizu, Senzo; Nomura, Isao; Yamamiya, Kazuo; and Masuda, Tsuneaki, 4,500,668, Cl. 524-427.000.
Norcross, Charles E., to C. S. Norcross & Sons. Slack adjuster. 4,499,978, Cl. 188-79.50K.
Nord, Keith W.: *See—*
Bacon, Forrest C.; and Nord, Keith W., 4,499,704, Cl. 53-156.000.
Norden, Alexander R. Sticks of parts and their use. 4,500,579, Cl. 428-43.000.
Nordica S.p.A.: *See—*
Perotto, Riccardo, 4,499,675, Cl. 36-119.000.
Nordquist, Albert W.: *See—*
Feagans, Frederick C.; and Nordquist, Albert W., 4,500,756, Cl. 200-5.00A.
Nordson Corporation: *See—*
Matt, Timothy S., 4,500,937, Cl. 361-153.000.
Nordstrom, Duane M., to Longview Fibre Company. Method and apparatus for making multiple ply paperboard. 4,500,381, Cl. 156-205.000.
Norsk Hydro a.s.: *See—*
Tag, Arne; Petterson, Bjorn R.; and Nygaard, Erik C., 4,500,369, Cl. 149-2.000.
Norson Industries, Inc.: *See—*
Bateson, Norman E., 4,500,230, Cl. 406-131.000.
North American Philips Lighting Corporation: *See—*
Graff, Eugene A., 4,500,810, Cl. 313-486.000.
North Sails, Inc.: *See—*
Mahr, Peter F., 4,499,842, Cl. 114-103.000.
Northern Telecom Limited: *See—*
Dubreuil, Luc; and Reed, Phillip J., 4,500,747, Cl. 174-76.000.
Murto, Tapio H., 4,500,755, Cl. 179-170.0NC.
Northrop Corporation: *See—*
Westhaver, Robert O.; Walker, Gary; and Koning, Menno G., 4,499,778, Cl. 74-5.00F.
Noso, Kazunori: *See—*
Kishi, Norimasa; and Noso, Kazunori, 4,501,012, Cl. 381-43.000.
Noto, Richard: *See—*
Smith, David C.; and Noto, Richard, 4,500,963, Cl. 364-300.000.
Noto, Yasuo; Naito, Shotaro; and Ohmae, Tsutomu, to Hitachi, Ltd. Protective control apparatus for electrical vehicle. 4,500,820, Cl. 318-139.000.
Novation, Inc.: *See—*
Mackey, Richard C., 4,500,754, Cl. 179-81.00R.
Nowacki, Ulrich G., to International Paper Company. Method and apparatus for erecting a carton with integral interior partitions. 4,500,306, Cl. 493-92.000.
Nozaki, Hidetoshi; Kamimura, Takaaki; Hatayama, Tamothu; and Utagawa, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Photovoltaic device. 4,500,744, Cl. 136-258.000.
NSK-Warner K.K.: *See—*
Ono, Katsuyasu, 4,500,115, Cl. 280-808.000.
NSS, Industries, Inc.: *See—*
Ewing, Peter D., 4,500,224, Cl. 403-343.000.
Nudd, Barry C.: *See—*
Maurer, Herman J.; Pedersen, Carl O.; and Nudd, Barry C., 4,500,250, Cl. 414-695.500.
Nunez, Cesar L.: *See—*
Espinosa, Fausto L.; and Nunez, Cesar L., 4,500,826, Cl. 318-820.000.
Nutt, Michael O.: *See—*
Cook, Frank T.; Nutt, Michael O.; and Hsieh, Hsin H., 4,500,717, Cl. 548-229.000.
Nuzzi, Frank J.: *See—*
Fruzzetti, Paul R.; Leavitt, Philip J.; and Nuzzi, Frank J., 4,499,752, Cl. 73-40.700.
N.V. Raychem S.A.: *See—*
De Groot, Hubert, 4,500,371, Cl. 156-48.000.
N.V. Weefautomaten Picanol: *See—*
Rosseel, Henri J.; and Deconinck, Filip N., 4,501,008, Cl. 377-2.000.
Nygaard, Erik C.: *See—*
Tag, Arne; Petterson, Bjorn R.; and Nygaard, Erik C., 4,500,369, Cl. 149-2.000.
Oba, Hiroyuki: *See—*
Fuchikami, Jun; Higashi, Hidehiro; Inoue, Takashi; and Oba, Hiroyuki, 4,500,645, Cl. 502-65.000.
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, to Mitsui Toatsu Chemicals, Incorporated. Process for the preparation of N-alkenylphenylmaleimides and N,N'-[alkenylenephenylene]bismalemides. 4,500,719, Cl. 548-522.000.
Obama, Kenjiro: *See—*
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Sato, Akihiro, 4,500,682, Cl. 525-240.000.
Obenland, Gerhard, to Durr Automation+Fordertechnik GmbH. Feeding device having alternatively connectable slip-on gear units. 4,499,788, Cl. 74-661.000.
Occidental Chemical Corporation: *See—*
Cotter, Byron R.; and Tang, David Y., 4,500,471, Cl. 260-544.00D.
Odaka, Kentaro: *See—*
Immink, Kornelis A.; Nijboer, Jakob G.; Ogawa, Hiroshi; and Odaka, Kentaro, 4,501,000, Cl. 375-25.000.
Ode, Bengt; and Tornblom, Lars, to Ab Asea-Atom. Pump means for pumping a mixture of coarse-grained material and fluid. 4,500,261, Cl. 417-203.000.
Odenthal, Conrad J.; and Askew, Dennis D., to Tektronix, Inc. Electron gun having a low capacitance cathode and grid assembly. 4,500,809, Cl. 313-444.000.
O'Dwyer, James B.: *See—*
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; and O'Dwyer, James B., 4,500,680, Cl. 525-143.000.
Oehley, Gernot F.: *See—*
Csaszar, Gabor; Oehley, Gernot F.; and Goldman, Fred M., 4,500,475, Cl. 261-36.00A.
Oetting, Hermann; and Heidemeyer, Paulus, to Volkswagenwerk Aktiengesellschaft. Hybrid drive arrangement. 4,499,965, Cl. 180-165.000.
Office National d'Etudes et de Recherche Aerospatiales: *See—*
Calvet, Pierre; and Platet, Bernard, 4,500,214, Cl. 374-36.000.
Officina Meccanica Giavelli S.p.A.: *See—*
Carraroli, Dario; and Giavelli, Giordano, 4,500,287, Cl. 432-246.000.
Ogawa, Akira: *See—*
Aoki, Kozo; Ogawa, Akira; and Tanabe, Osami, 4,500,635, Cl. 430-552.000.
Ogawa, Hiroshi; Mizuno, Chiaki; Masaki, Kouichi; Suzuki, Masaaki; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,500,599, Cl. 428-336.000.
Ogawa, Hiroshi: *See—*
Immink, Kornelis A.; Nijboer, Jakob G.; Ogawa, Hiroshi; and Odaka, Kentaro, 4,501,000, Cl. 375-25.000.
Ogawa, Masaki; and Shiomura, Yasuro, to Bridgestone Tire Company Limited. Method of modifying vulcanized rubber surface with halogenating agents. 4,500,685, Cl. 525-343.000.
Ogawa, Rokutaro: *See—*
Ohno, Kenichi; Hosomizu, Tohru; and Ogawa, Rokutaro, 4,500,906, Cl. 357-71.000.
Ogawa, Shungi: *See—*
Takahashi, Osamu; Yamamura, Nobuo; Mukunoki, Yasuo; Ogawa, Shungi; and Nakagawa, Yutaka, 4,500,362, Cl. 106-309.000.
Oger, Jacques; Hauer, Jean-Claude; and Freis, Jean-Louis, to Pont-A-Mousson S.A. Manhole. 4,499,695, Cl. 52-19.000.
Ogihara, Yutaka: *See—*
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,500,931, Cl. 358-310.000.
Ogino, Takashi: *See—*
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, 4,500,709, Cl. 544-58.100.
Ogletree, David D.: *See—*
Knepshield, William R.; Ogletree, David D.; and Sander, Nat, 4,499,898, Cl. 128-305.000.

Oguni, Kensaku: *See*—
Kuroda, Shigeaki; Senshu, Takao; Oguni, Kensaku; Mochizuki, Taketoshi; Yasuda, Hiromu; Ishibane, Kyuhei; Atsumi, Akira; Kimura, Hideyuki; and Hatada, Toshio, 4,500,035, Cl. 236-92.00B.

Ogura, Mutsuo, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Scanning-type lithographic and image-pickup device using optical fiber. 4,500,204, Cl. 356-318.000.

Ohba, Hitoshi: *See*—
Tanaka, Motoaki; Toyama, Takanori; Ohba, Hitoshi; and Yamaguchi, Osamu, 4,500,649, Cl. 502-167.000.

Ohishi, Chikashi, to Fuji Photo Film Co., Ltd. Electrophotographic element with copolymer interlayer. 4,500,620, Cl. 430-60.000.

Ohishi, Chikashi: *See*—
Shiba, Keisuke; Yazawa, Hiromi; Ohishi, Chikashi; and Nakao, Sho, 4,500,618, Cl. 430-49.000.

Ohlidal, Vladimi: *See*—
Junek, Jan; Skarka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Hacova, Kveta; Vobornik, Vaclav; Ohlidal, Vladimi; and Lihtarova, Ludmila, 4,499,718, Cl. 57-301.000.

Ohmae, Tsutomu: *See*—
Noto, Yasuo; Naito, Shotaro; and Ohmae, Tsutomu, 4,500,820, Cl. 318-139.000.

Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, to Daikin Kogyo Co., Ltd. Optical materials. 4,500,694, Cl. 526-245.000.

Ohmori, Kaoru: *See*—
Yoshida, Hiroshi; Koike, Kengo; Shimano, Shizuo; Nakagawa, Taizo; and Ohmori, Kaoru, 4,500,536, Cl. 514-397.000.

Ohmori, Nobuo: *See*—
Kitagawa, Katsutoshi; Isogai, Kiyoshi; Ohmori, Nobuo; Takita, Naka; Okamoto, Makoto; Koga, Itsuo; and Ito, Kazuo, 4,500,099, Cl. 277-228.000.

Ohmura, Hideo: *See*—
Miyano, Toshiyuki; and Ohmura, Hideo, 4,499,709, Cl. 53-589.000.

Ohmura, Kunioki; Torigoe, Masaaki; Itoh, Isamu; and Hayashi, Katsumi, to Fuji Photo Film Co., Ltd. Process for stabilizing silver images. 4,500,632, Cl. 430-428.000.

Ohmura, Yamichi; and Matsushita, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for forming monocrystalline semiconductor film on insulating film. 4,500,388, Cl. 156-603.000.

Ohno, Kenichi; Hosomizu, Tohru; and Ogawa, Rokutaro, to Fujitsu Limited. Multilevel masterslice LSI with second metal level programming. 4,500,906, Cl. 357-71.000.

Ohta, Takeo: *See*—
Kokai, Katsuaki; and Ohta, Takeo, 4,500,366, Cl. 148-111.000.

Ohta, Yoshio, to Matsushita Electric Industrial Co., Ltd. Solid state imaging apparatus. 4,500,924, Cl. 358-213.000.

Ohtani, Hideaki: *See*—
Kigasawa, Kazuo; Ohtani, Hideaki; and Kanezuka, Toshiyuki, 4,500,511, Cl. 424-81.000.

Ohtsuka, Yoshimichi: *See*—
Ninomiya, Yuichi; and Ohtsuka, Yoshimichi, 4,500,911, Cl. 358-36.000.

Ohyama, Tohru; and Nigorikawa, Shigeru, to Alps Electric Co., Ltd. RF Modulator. 4,500,920, Cl. 358-139.000.

Oikawa, Saburo: *See*—
Yatsuo, Tsutomu; Nagano, Takahiro; Oikawa, Saburo; and Horie, Akira, 4,500,903, Cl. 357-38.000.

Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,500,050, Cl. 242-198.000.

Oka, Takahiro: *See*—
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Sato, Akihiro, 4,500,682, Cl. 525-240.000.

Oka, Tetsuo: *See*—
Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, 4,500,640, Cl. 435-253.000.

Okada, Hiroshi: *See*—
Tajima, Shigeru; Okada, Hiroshi; and Nakano, Kenji, 4,500,822, Cl. 318-314.000.

Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Tsuyama, Setsuya; Kurihara, Kazuhiko; and Yazawa, Hiroshi, to Polymer Processing Research Institute Ltd. Process for broadening the width of a bundle of parallel filaments having a band form. 4,499,639, Cl. 28-282.000.

Okamoto, Hiroshi: *See*—
Gotou, Makoto; and Okamoto, Hiroshi, 4,500,830, Cl. 323-267.000.

Okamoto, Makoto: *See*—
Kitagawa, Katsutoshi; Isogai, Kiyoshi; Ohmori, Nobuo; Takita, Naka; Okamoto, Makoto; Koga, Itsuo; and Ito, Kazuo, 4,500,099, Cl. 277-228.000.

Okashima, Bob Y.: *See*—
Karazim, Michael P.; Okashima, Bob Y.; and Ashburn, John J., 4,499,691, Cl. 51-241.00S.

Okin, Kenneth: *See*—
Manton, John C.; and Okin, Kenneth, 4,500,958, Cl. 364-200.000.

Okumura, Jun: *See*—
Imae, Kiyoto; Aburaki, Shimpei; Narita, Yukio; Okumura, Jun; and Naito, Takayuki, 4,500,526, Cl. 514-226.000.

Older, Geoffrey I.; and Webb, Leigh S., to Air Products and Chemicals, Inc. Freezer. 4,499,740, Cl. 62-374.000.

Olin Corporation: *See*—
Breedis, John F.; and Fister, Julius C., 4,500,028, Cl. 228-117.000.
Fister, Julius C.; and Breedis, John F., 4,500,605, Cl. 428-469.000.
Ford, James M.; Dean, Robert A.; Woodard, Kenneth E., Jr.; and Branco, Antonio, 4,500,379, Cl. 156-172.000.
Kaczur, Jerry J.; and Coleman, John E., 4,500,499, Cl. 423-139.000.
Miles, Ronald C.; Geren, George W.; and Peel, R. W., 4,500,402, Cl. 204-242.000.

Oliver, Donald W.: *See*—
Culver, Richard B.; and Oliver, Donald W., 4,500,781, Cl. 250-269.000.

Olivieri, Icaro, to Icaro Olivieri & C. S.p.A. Ski boot with a device for registering its axial orientation in regard to the ski. 4,499,674, Cl. 36-117.000.

Olson, Edward A. Pet litter collecting device. 4,500,125, Cl. 294-1.0BA.

Olympia Werke AG: *See*—
Lange, Heinz; Rix, Albert; and Drogi, Dieter, 4,500,219, Cl. 400-568.000.

Olympus Optical Co., Ltd.: *See*—
Aoki, Masahiro, 4,500,189, Cl. 354-407.000.
Kasuga, Muneo; Shimizu, Akira; and Nishio, Tadashi, 4,500,199, Cl. 355-14.0CU.
Sato, Masaaki, 4,501,013, Cl. 381-86.000.
Takahashi, Susumu, 4,500,181, Cl. 350-574.000.
Takayama, Syuichi, 4,499,895, Cl. 128-6.000.
Tanikawa, Kowji, 4,500,183, Cl. 354-21.000.
Yamasaki, Masafumi, 4,500,192, Cl. 354-427.000.

Onishi, Toshiyuki: *See*—
Motoyama, Takeshi; Onishi, Toshiyuki; and Yokoyama, Kunio, 4,499,738, Cl. 62-155.000.

Ono, Katsuyasu, to NSK-Warner K.K. Mounting arrangement for through anchor. 4,500,115, Cl. 280-808.000.

Ono, Kouji: *See*—
Sakamoto, Eiichi; Kawasaki, Mikio; Ono, Kouji; Fukuoji, Kakujulo; and Fujimori, Noboru, 4,500,631, Cl. 430-413.000.

Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; and Karino, Yukio, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,500,636, Cl. 430-566.000.

Ono, Shoji: *See*—
Suzuki, Yoji; Imaizumi, Atsushi; Yamaguchi, Hisao; Kanesaki, Masaharu; and Ono, Shoji, 4,500,639, Cl. 435-244.000.

Onodera, Hisakithi: *See*—
Onuki, Jin; Soeno, Ko; Morita, Keiichi; and Onodera, Hisakithi, 4,500,904, Cl. 357-67.000.

Onuki, Jin; Soeno, Ko; Morita, Keiichi; and Onodera, Hisakithi, to Hitachi, Ltd. Semiconductor device. 4,500,904, Cl. 357-67.000.

Ooga, Hirotomo; and Sakurai, Hiromi, to Mitsubishi Denki Kabushiki Kaisha. Method of making a semiconductor device having protected edges. 4,499,657, Cl. 29-578.000.

Oouchi, Tomihisa: *See*—
Nishiguchi, Akira; Usui, Sanpei; Oouchi, Tomihisa; and Iwai, Kazumi, 4,499,859, Cl. 122-18.000.

Oppitz, Hans, to Eltac Nogler & Daum KG. Reinforcing or carrier element for structural material. 4,500,410, Cl. 204-299.00R.

Ormbsy, Lee S. Method of removing salts of the alkali earth metal group from water. 4,500,433, Cl. 210-669.000.

Orr, Alfred B.: *See*—
Monhardt, Richard J.; Orr, Alfred B.; and Wright, Joseph B., 4,500,252, Cl. 415-9.000.

Orth, Eugene C.; and Ebenhoch, Sebastian, to Waukesha Cutting Tools, Inc. Trepanning tool. 4,500,234, Cl. 408-206.000.

Ortwein, Hermann: *See*—
Braitsch, Hans; Ortwein, Hermann; and Vorwald, Josef, 4,500,037, Cl. 238-2.000.

Osada, Toshihiko: *See*—
Ban, Yasutaka; and Osada, Toshihiko, 4,500,789, Cl. 250-492.200.

Osaka, Hiroshi: *See*—
Tomizawa, Akimori; and Osaka, Hiroshi, 4,500,921, Cl. 358-174.000.

Osborn, Alfred W., to Rolls-Royce Limited. Mounting system for coupled turboshaft gas turbine engines. 4,500,054, Cl. 244-54.000.

Ostlinning, Edgar; and Idel, Karsten, to Bayer Aktiengesellschaft. Anhydrous preparation of polyarylene sulfide in one vessel reaction system. 4,500,702, Cl. 528-388.000.

Oswald, Thomas, to International Standard Electric Corporation. Optical transmission system and method. 4,501,022, Cl. 455-601.000.

Oswalt, Stephen M.: *See*—
Rabito, Thomas G.; Oswalt, Stephen M.; and Cline, Richard L., 4,500,606, Cl. 428-480.000.

Otto, Dieter: *See*—
Backe, Egbert; Muller, Rolf; Otto, Dieter; Leonardi, Cornelio; Kochendorfer, Heinrich; Fussner, Paul; Walker, Ewald; and Rommel, Rudi, 4,499,757, Cl. 73-119.00A.

Ottosen, Richard A.: *See*—
Roberts, Michael K.; Ottosen, Richard A.; and McConnell, Matthew L., 4,499,771, Cl. 73-632.000.

Outboard Marine Corporation: *See*—
Billingsley, Henry C.; and Clark, Amos M., 4,499,887, Cl. 123-575.000.
Hall, Charles B.; and Mondek, Martin J., 4,500,298, Cl. 440-62.000.

Over, William R.: *See*—
Brown, Christopher K.; Kensinger, Lex D.; Over, William R.; and Wion, Donald A., 4,499,648, Cl. 29-564.200.

Overberg, Karl W.: *See*—
Garrett, William G.; and Overberg, Karl W., 4,499,673, Cl. 361-56.000.

Overlack, Claus: *See*—
Reppel, Werner; and Overlack, Claus, 4,500,378, Cl. 156-160.000.

Owens-Corning Fiberglas Corporation: *See*—
Naul, George M., 4,500,583, Cl. 428-116.000.
Turner, Larry S., 4,499,702, Cl. 52-555.000.

Wong, Robert; Flautt, Martin C.; and Haines, Richard M., 4,500,600, Cl. 428-391.000.
Owens-Illinois, Inc.: *See*—
Bieringer, Robert J., 4,500,203, Cl. 356-240.000.
Mumford, Eustace H., 4,499,806, Cl. 83-527.000.
Steffan, Leonard D.; and Kohler, Robert D., 4,499,920, Cl. 137-624.150.
Stoll, Andy J., III, 4,500,007, Cl. 220-71.000.
Oy Wartsila Ab: *See*—
Uomala, Vilho; Sandstrom, Kjell; and Matilainen, Jorma, 4,500,092, Cl. 277-12.000.
Ozawa, Kunitaka: *See*—
Koumura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, 4,500,918, Cl. 358-75.000.
Ozawa, Takashi, to Fuji Xerox Co., Ltd. Original reading device. 4,500,927, Cl. 358-293.000.
P.I.V. Antrieb Werner Reimers GmbH & Co. KG: *See*—
Rattunde, Manfred, 4,500,305, Cl. 474-201.000.
Paalman, H. Hunter; and Drapeau, Denis, to Dow Chemical Company, The. Selective removal of H_2S from steam also containing CO_2. 4,500,500, Cl. 423-224.000.
Paberza, Monika Y.: *See*—
Grinberg, Grigory M.; Akifiev, Oleg N.; Pytel, Jury A.; Gilev, Anatoly P.; and Paberza, Monika Y., 4,500,516, Cl. 424-156.000.
Pabley, Avtar S. Saltwater and hard water bentonite mud. 4,500,436, Cl. 252-8.50A.
Pacific Scientific Company: *See*—
Larsen, Richard R., 4,500,026, Cl. 228-44.10R.
Pacific Western Systems, Inc.: *See*—
Ellenberger, Charles E.; Bower, George L.; and Snow, William R., 4,500,563, Cl. 427-38.000.
Staudacher, George E., 4,500,836, Cl. 324-73.0AT.
Pacifici, Joseph A.; and Bryant, Clifford A., to West Point Pepperell, Inc. Apparatus for uniformly applying either liquid or foam compositions to a moving web. 4,500,039, Cl. 239-193.000.
Page, Philip R.: *See*—
Villax, Ivan; and Page, Philip R., 4,500,458, Cl. 260-351.500.
Paisley, Kirk E.: *See*—
Fazio, Michael J.; and Paisley, Kirk E., 4,500,728, Cl. 560-222.000.
Palframan, John D.: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
Panavision, Inc.: *See*—
Nabulsi, Hazem, 4,500,916, Cl. 358-51.000.
Paper, Calmenson & Co.: *See*—
Reinhardt, Paige J., 4,500,766, Cl. 219-76.100.
Papizan, John L. Fishing seat tray. 4,500,059, Cl. 248-205.100.
Parish, James M., to B. F. Goodrich Company, The. Method and apparatus for releasing a submerged life raft. 4,499,844, Cl. 114-367.000.
Parkell, Edward; and Newkirk, Mark C., to Maul Technology Corporation. Glass stream cutting apparatus. 4,500,334, Cl. 65-334.000.
Pasichinskyj, Mario J.: *See*—
Merritt, Thomas D.; and Pasichinskyj, Mario J., 4,500,827, Cl. 322-3.000.
Patel, Nathalal G.: *See*—
Haury, Gilbert E.; Patel, Nathalal G.; Lockard, Walter G.; and Wiatrak, Thomas R., 4,500,102, Cl. 280-242.0WC.
Patrick, Willard J.: *See*—
Whitaker, Angus H.; McFarland, Keith E.; Lloyd, William A.; and Patrick, Willard J., 4,500,045, Cl. 242-57.100.
Patten, James W.; Moss, Ronald W.; and Forcht, Brennan A., to LTV Aerospace and Defense Co. Composite protective coating for carbon-carbon substrates. 4,500,602, Cl. 428-408.000.
Paulson, Bernard S.; Paulson, Bruce H.; Clark, Brian K.; and Briesemeister, Richard A., to Pixall Corporation. Self-cleaning support roller for an endless conveyor belt. 4,499,992, Cl. 198-498.000.
Paulson, Bruce H.: *See*—
Paulson, Bernard S.; Paulson, Bruce H.; Clark, Brian K.; and Briesemeister, Richard A., 4,499,992, Cl. 198-498.000.
Paulson, Danton L.: *See*—
Cole, Ernest R., Jr.; Lee, Agnes Y.; and Paulson, Danton L., 4,500,398, Cl. 204-117.000.
Paurat, Friedrich W.; and Paurat, Roland. Belt-type bulk-material conveyor for underground use. 4,499,993, Cl. 198-819.000.
Paurat, Roland: *See*—
Paurat, Friedrich W.; and Paurat, Roland, 4,499,993, Cl. 198-819.000.
Pavey, Charles F.: *See*—
Madewell, James A.; Molitor, Edwin A.; Crowe, Norman P.; Lampe, Guy W.; and Pavey, Charles F., 4,500,245, Cl. 414-108.000.
Paxhia, Frank V.: *See*—
Bucek, Francis J.; and Paxhia, Frank V., 4,500,928, Cl. 358-296.000.
PCB Piezotronics, Inc.: *See*—
Riggs, Michael T., 4,499,751, Cl. 73-4.00R.
PDL Industries Limited: *See*—
Cook, David L., 4,500,008, Cl. 220-242.000.
Peachee, C. Theodore, Jr., to Emerson Electric Co. Method of fabricating die cast rotor with one piece oil return/rotor shaft securement member. 4,499,661, Cl. 29-598.000.
Pearson, Leonard L.; and Litchfield, John, to Cole Polymers Limited. Preservation of structures. 4,500,568, Cl. 427-294.000.
Pecker, Calman: *See*—
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,500,428, Cl. 210-609.000.
Pedersen, Carl O.: *See*—
Maurer, Herman J.; Pedersen, Carl O.; and Nudd, Barry C., 4,500,250, Cl. 414-695.500.
Peel, R. W.: *See*—
Miles, Ronald C.; Geren, George W.; and Peel, R. W., 4,500,402, Cl. 204-242.000.
Pehl, Willis G.: *See*—
Bockwinkel, Joe L.; and Pehl, Willis G., 4,499,701, Cl. 52-555.000.
Peil, William: *See*—
Bitting, Ricky F.; and Peil, William, 4,500,821, Cl. 318-254.000.
Peloza, Kirk B., to Eaton Corporation. Fluid pressure signal transducer. 4,499,915, Cl. 137-85.000.
Peltier, Gerard; Longuet, Michel; and Midgley, Charles A., to Polysar International S.A. Foam rubber backings for composite materials having glass fiber substrates coated with PVC. 4,500,591, Cl. 428-251.000.
Penney, William H. Can puncturing and emptying device. 4,500,015, Cl. 222-83.500.
Pentel Kabushiki Kaisha: *See*—
Hashimoto, Junichi, 4,500,220, Cl. 401-53.800.
Penz, Perry A.; and Sampsell, Jeffrey B., to Texas Instruments Incorporated. Process for plastic LCD fill hole sealing. 4,500,171, Cl. 350-320.000.
Perez, Ricardo L.: *See*—
Murphy, Richard D.; Perez, Ricardo L.; and Clelford, Douglas H., 4,500,967, Cl. 364-434.000.
Perigo, John A.; and Divall, John E., to Metal Box p.l.c. Separable couplings for containers. 4,499,932, Cl. 141-91.000.
Perkins, Derek: *See*—
Austin, James W.; Bradburn, Ronald G.; Cromwell, Clarence A.; Gratch, Eitan; Groiss, Erich; Perkins, Derek; and Walker, Robert A., 4,500,496, Cl. 423-55.000.
Perkins, Frederick M., to Perko, Inc. Tri spherical lens assembly. 4,500,947, Cl. 362-311.000.
Perkins, Thomas K., to Atlantic Richfield Company. Viscous oil recovery using controlled pressure well pair drainage. 4,499,948, Cl. 166-248.000.
Perko, Inc.: *See*—
Perkins, Frederick M., 4,500,947, Cl. 362-311.000.
Permelec Electrode Ltd.: *See*—
Asano, Hisoshi; Shimamune, Takayuki; Goto, Toshiki; and Hosonuma, Masashi, 4,500,405, Cl. 204-290.00F.
Perotto, Riccardo, to Nordica S.p.A. Ski boot inner shoe. 4,499,675, Cl. 36-119.000.
Perron, Robert: *See*—
Gauthier-Lafaye, Jean; Perron, Robert; Gallucci, Jacques; and Leconte, Philippe, 4,500,473, Cl. 260-548.000.
Gauthier-Lafaye, Jean; and Perron, Robert, 4,500,474, Cl. 260-549.000.
Perry, Forbes G. D., to National Research Development Corporation. Transmission units of the toroidal race rolling friction type. 4,499,782, Cl. 74-200.000.
Personal Products Company: *See*—
Pieniak, Heinz A.; and Iskra, Michael J., 4,500,315, Cl. 604-379.000.
Persoon, Eric H. J.; and Abeysekera, Ratnayake M. S. S., to U.S. Philips Corporation. Device for the dynamic adjustment of a black/white discrimination threshold for the processing of images containing grey values. 4,501,016, Cl. 382-22.000.
Peter, Emmett B., III: *See*—
Rayfield, Wilson P.; Peter, Emmett B., III; and Shultz, Richard E., 4,500,085, Cl. 271-207.000.
Peters, Hartmut; and Ramcke, Bernd, to E.C.H. Will (GmbH & Co.). Machine for making ruled pads or the like. 4,500,241, Cl. 412-37.000.
Peters, Penn A.; Biller, Cleveland J.; and Johnson, David D., to United States of America, Agriculture. Transport carriage. 4,500,004, Cl. 212-80.000.
Petersen, Kurt-Eckard: *See*—
Vock, Jurgen; Pinck, Peter; Lange, Norbert; Schmalfeld, Erwin; and Petersen, Kurt-Eckard, 4,500,770, Cl. 219-121.0LK.
Peterson, Leroy L.: *See*—
Lewandowski, Edward F.; and Peterson, Leroy L., 4,499,708, Cl. 53-432.000.
Peterson, Richard R., to Sioux Technology, Inc. Locker shelf assembly. 4,500,146, Cl. 312-257.0SM.
Petitou, Maurice: *See*—
Lormeau, Jean-Claude; Petitou, Maurice; and Choay, Jean, 4,500,519, Cl. 514-56.000.
Petrarch Systems Inc.: *See*—
Arkles, Barry C., 4,500,688, Cl. 525-431.000.
Petrofsky, Jerrold S.; Phillips, Chandler A.; Glaser, Roger M.; and Heaton, Harry H., III, to Wright State University. System and method for treating paralyzed persons. 4,499,900, Cl. 128-423.00W.
Petrolite Corporation: *See*—
French, Eddie; and Braga, Thomas G., 4,500,445, Cl. 252-387.000.
Woods, John H.; Graves, Toby R.; Nasser, William E.; and Jagtap, Ashvinkumar N., 4,500,359, Cl. 106-270.000.
Petschauer, Thomas W.: *See*—
Bennett, Donald B.; Thorsrud, Lee T.; and Petschauer, Thomas W., 4,500,988, Cl. 370-85.000.
Petterson, Bjorn R.: *See*—
Tag, Arne; Petterson, Bjorn R.; and Nygaard, Erik C., 4,500,369, Cl. 149-2.000.

Pettingell, James T., to Hancock, Robert D. Method and apparatus for manufacturing a hot spot thermocouple. 4,500,031, Cl. 228-179.000.

Petty-Weeks, Bruce C.; and Zeitlin, Martin A., to Standard Oil Company (Indiana). Process for removal and recycle of p-toluic acid from terephthalic acid crystallizer solvent. 4,500,732, Cl. 562-486.000.

Peyton, Richard H.: *See—*
Thorton, Donald I.; and Peyton, Richard H., 4,500,425, Cl. 210-136.000.

Pfafflin, James R.: *See—*
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,500,428, Cl. 210-609.000.

Pfenninger, Heinz: *See—*
Hugelshofer, Paul; Bruttel, Beat; Pfenninger, Heinz; and Lacroix, Roger, 4,500,321, Cl. 8-527.000.

Pfizer Inc.: *See—*
Lombardino, Joseph G.; and Harbert, Charles A., 4,500,535, Cl. 514-277.000.

Philipp Holzmann Aktiengesellschaft: *See—*
Baumann, Theodor; and Schreyegg, Otmar, 4,499,699, Cl. 52-169.100.

Phillips, Chandler A.: *See—*
Petrofsky, Jerrold S.; Phillips, Chandler A.; Glaser, Roger M.; and Heaton, Harry H., III, 4,499,900, Cl. 128-423.00W.

Phillips, Donald E., to Rockwell International Corporation. Wide range phase detector utilizing a plurality of stacked detector modules. 4,500,852, Cl. 331-12.000.

Phillips Petroleum Company: *See—*
Beardmore, David H., 4,500,281, Cl. 431-3.000.
DuBroff, Richard E., 4,500,976, Cl. 367-48.000.
Hutson, Thomas, Jr., 4,500,490, Cl. 422-62.000.
Mathis, Ronald D.; Reed, Jerry O.; and Hagler, Gerald E., 4,500,706, Cl. 528-502.000.
Tillman, Willie, 4,500,491, Cl. 422-150.000.
Walters, John P., 4,499,930, Cl. 141-8.000.

Piaggi, Alberto. Processes for manufacturing specific products suitable for the storage, transport, preparation and consumption of food, and drinks and products obtained by said processes, such as plates, soup plates, vessels, cups, glasses and the like. 4,500,573, Cl. 428-35.000.

Picard, Salvatore R.: *See—*
Naubereit, Henry; Beyer, Henry R.; DeSipio, Richard G.; and Picard, Salvatore R., 4,500,884, Cl. 343-456.000.
Naubereit, Henry; Long, Thomas F.; Picard, Salvatore R.; and Ritz, Joseph, 4,500,886, Cl. 343-456.000.

Pickel, Hans: *See—*
Neitz, Alfred; D'Alfonso, Nunzio; and Pickel, Hans, 4,499,871, Cl. 123-276.000.

Pieniak, Heinz A.; and Iskra, Michael J., to Personal Products Company. Superthin absorbent product. 4,500,315, Cl. 604-379.000.

Pike, Winthrop S., to RCA Corporation. Diode simulator circuit. 4,500,798, Cl. 307-317.00R.

Pikorz, Wolfgang: *See—*
Sommer, Karl H.; Sonntag, Alois; and Pikorz, Wolfgang, 4,500,901, Cl. 357-38.000.

Pilgram, Kurt H.; and Price, Thomas P., to Shell Oil Company. Isoxazolotriazindiones and plant growth inhibiting use thereof. 4,500,345, Cl. 71-93.000.

Pilliard, J. Paul: *See—*
Hoyt, Robert M.; Bobbitt, Donald E.; Bartee, Gary E.; Garton, Stanley C.; and Pilliard, J. Paul, 4,499,698, Cl. 52-157.000.

Pinck, Peter: *See—*
Vock, Jurgen; Pinck, Peter; Lange, Norbert; Schmalfeld, Erwin; and Petersen, Kurt-Eckard, 4,500,770, Cl. 219-121.0LK.

Pinnick, Robert V.: *See—*
Diederich, Dennis A.; Wiegmann, Thomas B.; and Pinnick, Robert V., 4,500,309, Cl. 604-5.000.

Pioneer Electronic Corporation: *See—*
Sugihara, Masanori, 4,500,049, Cl. 242-186.000.
Takemasa, Kaoru, 4,499,783, Cl. 74-411.000.

Pioneoer Electronic Corporation: *See—*
Nakayama, Kazuaki, 4,500,849, Cl. 330-300.000.

Pitney Bowes Inc.: *See—*
Buan, Danilo P.; and Eckert, Alton B., 4,500,780, Cl. 250-231.0SE.
Dannatt, Hugh St. L., 4,500,197, Cl. 355-8.000.

Pixall Corporation: *See—*
Paulson, Bernard S.; Paulson, Bruce H.; Clark, Brian K.; and Briesemeister, Richard A., 4,499,992, Cl. 198-498.000.

Plank, Vernon G.; Matthews, Anthony J.; Berthel, Robert O.; and LaGross, Dennis L., to United States of America, Air Force. Snow scale/rate meter. 4,499,761, Cl. 73-170.00R.

Plannja AB: *See—*
Gustafsson, Erik, 4,499,700, Cl. 52-478.000.

Plastic Specialties and Technologies, Inc.: *See—*
Gerteisen, Steven R.; Wenger, Richard M.; and Cannavo, Glenn M., 4,500,595, Cl. 428-294.000.

Platel, Alain Y.; Lacour, Alain P.; and Bourgery, Guy R., to Delalande S.A. Therapeutical use of (1-cinnamoyl or 1-phenethylcarbonyl) piperazine derivatives. 4,500,531, Cl. 514-255.000.

Platet, Bernard: *See—*
Calvet, Pierre; and Platet, Bernard, 4,500,214, Cl. 374-.6.000.

Platt, Clark I., to Whirlpool Corporation. Vacuum cleaning apparatus. 4,499,628, Cl. 15-419.000.

Pletsch, Hubert: *See—*
Wolf, Franz-Josef; and Pletsch, Hubert, 4,500,300, Cl. 464-83.000.

Pliml, Frank V., Jr., to Illinois Tool Works Inc. Tension indicating washer for smooth and irregular surfaces. 4,500,237, Cl. 411-11.000.

Plotkin, Victor, to New Hermes Incorporated. Engraving apparatus. 4,500,236, Cl. 409-86.000.

Plunkett, Luther C., Jr., to Lanier Business Products, Inc. Telephone answering apparatus with recorded time of day and date. 4,500,753, Cl. 179-6.030.

Plurichemie Anstalt: *See—*
Villax, Ivan; and Page, Philip R., 4,500,458, Cl. 260-351.500.

Pokorny, Erich: *See—*
Beck, Ernst; Lenard, Peter; and Pokorny, Erich, 4,499,794, Cl. 76-75.000.

Polak, Anthony J.; and Beuhler, Allyson J., to UOP Inc. Polymer blended membranes. 4,500,667, Cl. 524-406.000.

Polygram GmbH: *See—*
Bluthgen, Bjorn, 4,501,014, Cl. 381-94.000.

Polymer Processing Research Institute Ltd.: *See—*
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Tsuyama, Setsuya; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,499,639, Cl. 28-282.000.

Polysar International S.A.: *See—*
Peltier, Gerard; Longuet, Michel; and Midgley, Charles A., 4,500,591, Cl. 428-251.000.

Polytronics, Inc.: *See—*
Bertsc!., Jack, 4,500,160, Cl. 339-166.00R.

Pont-A-Mousson S.A.: *See—*
Oger, Jacques; Hauer, Jean-Claude; and Freis, Jean-Louis, 4,499,695, Cl. 52-19.000.

Poole, John S.; Gere, Dennis R.; Bell, Raymond J.; and Nickerson, Mark A., to Hewlett-Packard Company. Automated sample concentrator for trace components. 4,500,432, Cl. 210-659.000.

Pope, John R., to USM Corporation. Horn for use in transmitting ultrasonic vibrations. 4,499,845, Cl. 116-137.00A.

Porat, Chaim; and Sadeh, Yaacov, to Beta Engineering & Development Ltd. Testing device for an intrusion detection system. 4,500,873, Cl. 340-515.000.

Post Office, The: *See—*
Ferro, Berkeley M.; and Walker, Aubrey D., 4,500,116, Cl. 283-92.000.

Povazancova, Marta: *See—*
Durmis, Julius; Balogh, Alojz; Karvas, Milan; Hrachovcova, Maria; Masek, Jan; Caucik, Pavol; and Povazancova, Marta, 4,500,446, Cl. 252-403.000.

Poznansky, Abraham: *See—*
Bond, Armand P.; Poznansky, Abraham; and Grobner, Paul J., 4,500,351, Cl. 75-128.00N.

PPG Industries, Inc.: *See—*
Krogh, James A., 4,500,726, Cl. 56-160.000.
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; and O'Dwyer, James B., 4,500,680, Cl. 525-143.000.

Pratt-Read Corporation: *See—*
Feagans, Frederick C.; and Nordquist, Albert W., 4,500,756, Cl. 200-5.00A.

Pressaco, Pierre; and Carre , Jean-Jacques, to Societe Anonyme D.B.A. Servo-motor for power-assisted braking. 4,499,812, Cl. 91-376.00R.

Presto Lock, Inc.: *See—*
Bako, Lazlo; and Scelba, Stephen S., 4,499,681, Cl. 42-1.00Y.

Prete, Ralph, to Stone Safety Corporation. Chopping type electrical converter. 4,500,949, Cl. 363-28.000.

Price, Thomas P.: *See—*
Pilgram, Kurt H.; and Price, Thomas P., 4,500,345, Cl. 71-93.000.

Prima Valves International (Proprietary) Limited: *See—*
Scragg, Edgar P., 4,499,686, Cl. 47-48.500.

Prince Corporation: *See—*
Fleming, Dennis J., 4,500,131, Cl. 296-97.00K.

Prince, Terry K.: *See—*
Kelley, William J.; and Prince, Terry K., 4,500,299, Cl. 446-230.000.

Process Research Development & Management, Inc.: *See—*
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,500,428, Cl. 210-609.000.

Prolingheuer, Ernst-Christoph: *See—*
Rasshofer, Werner; and Prolingheuer, Ernst-Christoph, 4,500,656, Cl. 521-164.000.

Prosnitz, Donald: *See—*
Szoke, Abraham; and Prosnitz, Donald, 4,500,843, Cl. 330-4.300.

Protectair Limited: *See—*
Young, David E., 4,500,313, Cl. 604-280.000.

Prussin, Samuel: *See—*
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,500,337, Cl. 71-67.000.
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,500,339, Cl. 71-67.000.

Prussin, Samuel, deceased: *See—*
Young, Robert W.; Prussin, Samuel, deceased; and Gaylord, Norman G., 4,500,338, Cl. 71-67.000.

Prussin, Shirley, executor: *See—*
Young, Robert W.; Prussin, Samuel, deceased; and Gaylord, Norman G., 4,500,338, Cl. 71-67.000.

Puglia, Wayne J.; Kehoe, Gary S.; and Clark, K. Warren, to Nabisco Brands, Inc. Reduced-shrink bubble gum. 4,500,547, Cl. 426-3.000.

Puthawala, Anwer: *See—*
Kuhnke, Klaus; Bege, Dietmar; Puthawala, Anwer; and Wittrowsky, Gunter, 4,500,449, Cl. 252-628.000.

Putman, Richard E., to Westinghouse Electric Corp. Industrial process control apparatus and method. 4,500,950, Cl. 364-138.000.

Puxbaumer, Hans-Hermann: *See*—
Simo, Thomas; Eisenlohr, Karl-Heniz; and Puxbaumer, Hans-Hermann, 4,500,415, Cl. 208-56.000.
Pytel, Jury A.: *See*—
Grinberg, Grigory M.; Akifiev, Oleg N.; Pytel, Jury A.; Gilev, Anatoly P.; and Paberza, Monika Y., 4,500,516, Cl. 424-156.000.
Quicksteel Engineering Pty. Ltd.: *See*—
Quittner, John P., 4,500,225, Cl. 404-6.000.
Quillet, Jean-Pierre: *See*—
Ricouard, Jacques; and Quillet, Jean-Pierre, 4,499,745, Cl. 70-285.000.
Quin, Dorothy L., administratrix: *See*—
Quin, Murray L., deceased, 4,500,796, Cl. 307-147.000.
Quin, Murray L., deceased (by Quin, Dorothy L., administratrix), to Emerson Electric Co. System and method of electrically interconnecting multiple lighting fixtures. 4,500,796, Cl. 307-147.000.
Quinones, Richard J.: *See*—
Vezirian, Edward; Quinones, Richard J.; and Lockstedt, Alan W., 4,499,642, Cl. 29-149.50R.
Quittner, John P., to Quicksteel Engineering Pty. Ltd. Transferable roadway lane divider. 4,500,225, Cl. 404-6.000.
R. R. Donnelley & Sons Company: *See*—
Wong, Did-Bun, 4,500,083, Cl. 270-54.000.
Rabito, Thomas G.; Oswalt, Stephen M.; and Cline, Richard L., to Ashland Oil, Inc. Sealer for polyester and method of use to obtain laminates. 4,500,606, Cl. 428-480.000.
Raden, Daniel S.: *See*—
Carlsen, Russell O.; Casati, Francois M.; and Raden, Daniel S., 4,500,654, Cl. 521-129.000.
Radovsky, Everett S. Flush and refill device. 4,499,615, Cl. 4-366.000.
Radtke, Robert P., to Strata Bit Corporation. Method of drill bit manufacture. 4,499,795, Cl. 76-108.00A.
Radtke, Robert P.; and Morris, Wilford V., to Strata Bit Corporation. Drag blade bit with diamond cutting elements. 4,499,958, Cl. 175-329.000.
Raidel, John E. Wide base air spring suspension system. 4,500,112, Cl. 280-693.000.
Raker, John W.: *See*—
Ruetschle, Rudolph H.; and Raker, John W., 4,499,834, Cl. 112-2.000.
Rall, Ulrich: *See*—
Grunert, Heinz; Hahn, Fritz; Rall, Ulrich; Schumann, Klaus; Schwuger, Milan J.; and Smolka, Heinz G., 4,500,320, Cl. 8-442.000.
Ralston Purina Company: *See*—
Chu, Wayne S., 4,500,555, Cl. 426-479.000.
Ramcke, Bernd: *See*—
Peters, Hartmut; and Ramcke, Bernd, 4,500,241, Cl. 412-37.000.
Ramesohl, Hubert: *See*—
Klotmann, Fred; and Ramesohl, Hubert, 4,500,285, Cl. 432-103.000.
Rametta, Anthony J., to Minnesota Mining and Manufacturing Company. Anaerobically-curing compositions. 4,500,608, Cl. 428-522.000.
Ramsey, Maynard, III: *See*—
Chang, Joseph J.; and Ramsey, Maynard, III, 4,499,901, Cl. 128-635.000.
Rankel, Lillian A.; and Valyocsik, Ernest W., to Mobil Oil Corporation. Process for the preparation of mordenite utilizing transition metal complexes during crystallization. 4,500,503, Cl. 423-329.000.
Rao, S. Prabhakara: *See*—
Brothers, Lance E.; and Rao, S. Prabhakara, 4,500,357, Cl. 106-90.000.
Rapacz, Deirdre T.: *See*—
Lee, Calvin K.; and Rapacz, Deirdre T., 4,500,592, Cl. 428-251.000.
Rascle, Roger; and Lange, Francois, to Thomson-CSF. Method for removal of a data carrier disk after molding. 4,500,486, Cl. 264-335.000.
Rasmussen, Donald C., deceased (by Rasmussen, Jaunice O., executor); and Kozel, James A., deceased (by Kozel, Violet M., executor), to Singer Company, The. Air valve. 4,500,068, Cl. 251-205.000.
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Rattunde, Manfred, to P.I.V. Antrieb Werner Reimers GmbH & Co. KG. Side-bar chain for infinitely variable cone pulley transmissions. 4,500,305, Cl. 474-201.000.
Rautio, Kauko. Cutter for square timber hewing machine. 4,499,934, Cl. 144-176.000.
Ravinet, Pierre: *See*—
Broussoux, Dominique; Facoetti, Hugues; Ravinet, Pierre; Bernard, Daniel; and Micheron, Francois, 4,500,377, Cl. 156-164.000.
Ray, Siba P.: *See*—
Weyand, John D.; Woods, Robert W.; DeYoung, David H.; and Ray, Siba P., 4,500,406, Cl. 204-293.000.
Rayfield, Wilson P.; Peter, Emmett B., III; and Shultz, Richard E., to Burroughs Corporation. Oscillating wheel paper item stacking apparatus. 4,500,085, Cl. 271-207.000.
Raytheon Company: *See*—
Varteresian, Michael G.; and Steele, S. Robert, 4,499,659, Cl. 29-589.000.
RCA Corporation: *See*—
Bolger, Thomas V., 4,500,912, Cl. 358-31.000.
Coyle, Peter J., 4,499,996, Cl. 206-444.000.
Duvall, William E.; and Hwang, Mau-Choung P., 4,500,923, Cl. 358-190.000.
Hamalainen, Kaarlo J.; and Reitmeier, Glenn A., 4,500,930, Cl. 358-310.000.
Harwood, Leopold A., 4,500,910, Cl. 358-28.000.
Johnston, Loren B., Jr., 4,500,815, Cl. 315-366.000.
McCandless, Harry E., 4,500,808, Cl. 313-409.000.
Miller, Edward A., 4,499,853, Cl. 118-725.000.
Pike, Winthrop S., 4,500,798, Cl. 307-317.00R.
Turner, Robert L., 4,499,995, Cl. 206-312.000.
Wierschke, Donald J., 4,500,393, Cl. 204-5.000.
Wilbur, Leonard P., Jr.; and Van Renssen, Marinus, 4,500,767, Cl. 219-78.010.
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Fontana, Jack J.; and Reams, Walter, 4,500,674, Cl. 524-650.000.
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Kuhn, Franz; Lippek, Wilfried; Mollgaard, Klaus; and Redecker, Friedrich, 4,500,972, Cl. 364-526.000.
Redmond, Russell J.; and Ash, Jessica B., to American Hospital Supply Corporation. External ventricular drainage assembly. 4,500,311, Cl. 604-246.000.
Reed, Anthony R.: *See*—
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,500,437, Cl. 252-8.55C.
Reed, Geoffrey R.: *See*—
Laws, William R.; and Reed, Geoffrey R., 4,499,746, Cl. 72-13.000.
Reed, Jerry O.: *See*—
Mathis, Ronald D.; Reed, Jerry O.; and Hagler, Gerald E., 4,500,706, Cl. 528-502.000.
Reed, Phillip J.: *See*—
Dubreuil, Luc; and Reed, Phillip J., 4,500,747, Cl. 174-76.000.
Reese, James A.; and Dean, Raymond H., to Tempmaster Corporation. Electronic control arrangement for system powered HVAC terminal units. 4,500,034, Cl. 236-49.000.
Regan, John R.: *See*—
Suh, John T.; Barton, Jeffrey N.; and Regan, John R., 4,500,713, Cl. 546-165.000.
Regge, Dieter, to Windmoller & Holscher. Central gear driven flexographic printing press accommodating different diameter plate cylinders. 4,499,826, Cl. 101-181.000.
Regie Nationale des Usines Renault: *See*—
Brisabois, Roger, 4,499,791, Cl. 74-700.000.
Reginato, Francesco, to Lima S.p.A. Modular control panel for miniature-railway switches. 4,500,058, Cl. 246-3.000.
Reiji, Oguma; and Akihiro, Hirai, to Toshiba Ceramics Co., Ltd. Infrared absorbing quartz glass with iron and aluminum. 4,500,642, Cl. 501-54.000.
Reimann, Hans; Frydman, Allen; and Fuchs, Uwe, to Linde Aktiengesellschaft. Process for the biological purification of waste water. 4,500,429, Cl. 210-616.000.
Reinert, Gerard E.: *See*—
Schmidt, Manfred; Witman, Mark W.; Reinert, Gerard E.; and Lim, In C., 4,500,653, Cl. 521-90.000.
Reinhardt, Paige J., to Paper, Calmenson & Co. Method of fusion of inserts to snow plow runners. 4,500,766, Cl. 219-76.100.
Reister, Richard A. Refrigerator shelf doors. 4,500,147, Cl. 312-291.000.
Reitmeier, Glenn A.: *See*—
Hamalainen, Kaarlo J.; and Reitmeier, Glenn A., 4,500,930, Cl. 358-310.000.
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Kroupa, Loretta A.; and Relyea, Elton H., 4,500,659, Cl. 523-213.000.
Ren, Chung-Li; Thompson, Matthew V.; and Wang, Han-Chiu, to AT&T Bell Laboratories. Filter for existing waveguide structures. 4,500,859, Cl. 333-208.000.
Rentch, Bruce W. Phonograph record and album frame. 4,499,994, Cl. 206-45.190.
Repa, Otto, to Mauser-Werke Oberndorf GmbH. Trigger mechanism. 4,499,684, Cl. 42-69.00A.
Reppel, Werner; and Overlack, Claus, to Casimir Kast GmbH & Co. KG. Process and an apparatus for producing wooden components designed for resisting flexural loads. 4,500,378, Cl. 156-160.000.
Research and Development Institute for Infosystems, Inc.: *See*—
Mandeberg, Richard D., 4,500,908, Cl. 358-11.000.
Respiratory Care, Inc.: *See*—
Cambio, Orlando D., Jr., 4,500,480, Cl. 261-104.000.
Restaurant Technology, Inc.: *See*—
Strong, William K., 4,499,818, Cl. 99-483.000.
Rhone-Poulenc Chimie de Base: *See*—
Gauthier-Lafaye, Jean; Perron, Robert; Gallucci, Jacques; and Leconte, Philippe, 4,500,473, Cl. 260-548.000.
Gauthier-Lafaye, Jean; and Perron, Robert, 4,500,474, Cl. 260-549.000.
Rhone-Poulenc-Textile: *See*—
Desjobert, Gilles; and Jaillet, Andre , 4,499,707, Cl. 53-429.000.
Richards, Powell: *See*—
Srivastava, Suresh C.; Fawwaz, Rashid A.; and Richards, Powell, 4,500,508, Cl. 424-1.100.

Richardson, Ryden L.: *See*—
Simpson, Howard D.; Richardson, Ryden L.; and Baron, Kenneth, 4,500,424, Cl. 208-216.0PP.
Ricoh Company, Ltd.: *See*—
Kubo, Keishi; Watanabe, Hideo; Takigawa, Nobuhiro; Hagiri, Minoru; and Kawasaki, Kanjiro, 4,500,896, Cl. 346-204.000.
Shimada, Masaru; and Sasaki, Masaomi, 4,500,355, Cl. 106-22.000.
Shimura, Akira, 4,500,196, Cl. 355-3.0DD.
Tomita, Satoru; Shimura, Akira; and Yokota, Takashi, 4,499,849, Cl. 118-652.000.
Ricoh Systems, Inc.: *See*—
Wurster, Herbert K., 4,500,621, Cl. 430-72.000.
Ricouard, Jacques; and Quillet, Jean-Pierre, to L.A.S. Ricouard S.A. Combination cylinder lock. 4,499,745, Cl. 70-285.000.
Ridgewell, Terence E.; and Vallis, Keith, to Kimberly-Clark Limited. Catch or lock. 4,500,120, Cl. 292-19.000.
Riegel, Ulrich: *See*—
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,500,437, Cl. 252-8.55C.
Rieger, Franz: *See*—
Linder, Ernst; Moser, Winfried; and Rieger, Franz, 4,499,867, Cl. 123-145.00A.
Riester, James A.: *See*—
Katsen, Boris J.; Brinkworth, Robert T.; Kay, Daniel J.; and Riester, James A., 4,500,354, Cl. 106-21.000.
Riggs, Michael T., to PCB Piezotronics, Inc. Dynamic pressure generator. 4,499,751, Cl. 73-4.00R.
Riollet, Gilbert; and Bessay, Raymond, to Alsthom-Atlantique. Valve for adjusting the rate of flow of a gaseous fluid. 4,500,070, Cl. 251-282.000.
Riollet, Gilbert: *See*—
Bessay, Raymond; and Riollet, Gilbert, 4,500,256, Cl. 415-191.000.
Ritter, Gerhard: *See*—
Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, 4,500,763, Cl. 219-58.000.
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Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, 4,500,763, Cl. 219-58.000.
Ritz, Joseph: *See*—
Beyer, Henry R.; DeSipio, Richard G.; Long, Thomas F.; and Ritz, Joseph, 4,500,885, Cl. 343-456.000.
Naubereit, Henry; Long, Thomas F.; Picard, Salvatore R.; and Ritz, Joseph, 4,500,886, Cl. 343-456.000.
Ritzer, Alan: *See*—
Ward, William J., III; Ritzer, Alan; Carroll, Kenneth M.; and Flock, John W., 4,500,724, Cl. 556-472.000.
Rix, Albert: *See*—
Lange, Heinz; Rix, Albert; and Drogi, Dieter, 4,500,219, Cl. 400-568.000.
Rizzo, John S., to AT&T Technologies, Inc. Contacting a surface for plating thereon. 4,500,394, Cl. 204-15.000.
Robert Bosch GmbH: *See*—
Ahner, Peter; Harer, Helmut; and Schustek, Siegfried, 4,500,772, Cl. 219-209.000.
Linder, Ernst; Moser, Winfried; and Rieger, Franz, 4,499,867, Cl. 123-145.00A.
Romann, Peter; Sauer, Rudolf; and Steinrucken, Heinrich, 4,500,866, Cl. 338-126.000.
Roberts, Don M.; and Looper, David W., to Halliburton Company. Enclosure for electronic components. 4,500,944, Cl. 361-384.000.
Roberts, Michael K.; Ottosen, Richard A.; and McConnell, Matthew L., to Bion Corporation. Ultrasound visualization systems. 4,499,771, Cl. 73-632.000.
Roberts, Todd N.: *See*—
Fiorina, Mark A.; and Roberts, Todd N., 4,499,764, Cl. 73-253.000.
Robinson, James E., to UHV Instruments Ltd. Vacuum sample introduction unit. 4,499,776, Cl. 73-863.850.
Rochat, Alain C.; and Cassar, Luigi, to Ciba-Geigy Corporation. Process for producing bismethine isoindolines. 4,500,718, Cl. 548-471.000.
Roche, William J., to GTE Products Corporation. Electronic ballast circuit. 4,500,812, Cl. 315-171.000.
Rockwell International Corporation: *See*—
Carver, John H., 4,500,986, Cl. 370-58.000.
Frankel, Milton B.; and Wilson, Edgar R., 4,499,723, Cl. 60-211.000.
Grantham, LeRoy F., 4,499,833, Cl. 110-342.000.
Hallford, Ben R., 4,500,847, Cl. 330-277.000.
Kleinhans, William A., 4,500,200, Cl. 356-152.000.
Morey, William A., 4,500,841, Cl. 328-146.000.
Phillips, Donald E., 4,500,852, Cl. 331-12.000.
Schulz, David W.; and Spaulding, Gail E., 4,500,033, Cl. 228-219.000.
Weber, James L., 4,499,976, Cl. 188-71.900.
Yeh, Pochi A., 4,500,178, Cl. 350-404.000.
Rodemann, Alfred H.: *See*—
Insinger, Richard H., III; and Rodemann, Alfred H., 4,500,295, Cl. 434-218.000.
Roehl, Ernest O. Method of extracting perchlorethylene from dry cleaner filter cartridges. 4,500,363, Cl. 134-10.000.
Rohner, Joachim: *See*—
Chardon, Manfred; Mauries, Reinhard; Rohner, Joachim; and Zumfeld, Heinz, 4,499,715, Cl. 57-22.000.
Rolls-Royce Limited: *See*—
Dodd, Alec G.; and Hamblett, Martin, 4,500,258, Cl. 416-97.00R.
Osborn, Alfred W., 4,500,054, Cl. 244-54.000.
Romand-Monnier, Jacques; and Lejeune, Jean-Pierre, to Alsthom-Atlantique. Coupling device, an electric motor fitted with said device and a method of coupling two electric motors together. 4,500,226, Cl. 403-13.000.
Romann, Peter; Sauer, Rudolf; and Steinrucken, Heinrich, to Robert Bosch GmbH. Electric potentiometer. 4,500,866, Cl. 338-126.000.
Rommel, Rudi: *See*—
Backe, Egbert; Muller, Rolf; Otto, Dieter; Leonardi, Cornelio; Kochendorfer, Heinrich; Fussner, Paul; Walker, Ewald; and Rommel, Rudi, 4,499,757, Cl. 73-119.00A.
Rooney, Craig E., to Engineering Research Applications, Inc. Momentary digital encoding device for keyboards. 4,500,757, Cl. 200-5.00A.
Rosen, Perry: *See*—
Chan, Ka-Kong; Holland, George W.; and Rosen, Perry, 4,500,462, Cl. 260-405.500.
Rosseel, Henri J.; and Deconinck, Filip N., to N.V. Weefautomaten Picanol. Device for electronically controlling loom components. 4,501,008, Cl. 377-2.000.
Rossell Electronique SA: *See*—
Rossell, Jame, 4,500,768, Cl. 219-86.250.
Rossell, Jame, to Rossell Electronique SA. Electrode mounting support. 4,500,768, Cl. 219-86.250.
Roto-Finish Company, Inc.: *See*—
Balz, Gunther W., 4,499,692, Cl. 51-313.000.
Rouette, Andre : *See*—
Lafortune, Lucien; and Rouette, Andre , 4,500,006, Cl. 215-224.000.
Roussel, Philippe, to Lasag AG. Optical head of an installation for observation and treatment of the eye by laser radiation. 4,499,897, Cl. 128-303.100.
Roussel Uclaf: *See*—
Bianchi, Mario; and Barzaghi, Fernando, 4,500,731, Cl. 514-452.000.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,500,720, Cl. 549-313.000.
Rova, Jan-Erik. Arrangement in spring suspension systems particularly for vehicles. 4,500,076, Cl. 267-8.00R.
Rovsek, Edward. Game box. 4,500,091, Cl. 273-269.000.
Rowley, Alan G.; and Husband, Fiona M., to National Research Development Corporation. Removal of toxic metals from aqueous solution. 4,500,497, Cl. 423-89.000.
Rozmus, Walter J.; and Dietrich, Jerry L., to Kelsey-Hayes Company. Sealed container. 4,500,009, Cl. 220-256.000.
Rozniecki, Edward J. Gas expansion motor. 4,500,254, Cl. 415-75.000.
Rude, Edward T.: *See*—
Waine, Martin; Rude, Edward T.; and Nisenson, Jules, 4,499,937, Cl. 160-41.000.
Rudell, Elliot A.; Shumate, Michael E.; and Cernansky, Joseph S., to Rudell, Elliot A. Bicycle and doll mechanism. 4,500,104, Cl. 280-289.00D.
Ruetschle, Rudolph H.; and Raker, John W., to Harris Graphics Corporation. Reject assembly for sheet material handling apparatus. 4,499,834, Cl. 112-2.000.
Ruggieri, Daniela: *See*—
Bernardi, Luigi; Temperilli, Aldemio; Ruggieri, Daniela; Arcari, Giuliana; and Salvati, Patricia, 4,500,712, Cl. 546-67.000.
Ruhl, Edward A., to Sharp Die & Mold Company, Inc., a subsidiary of R & R Plastic Material, Inc. Quick change locator clamp assembly for plastic molding machine. 4,500,275, Cl. 425-192.00R.
Runck, Robin B.: *See*—
Brenton, Ronald G.; and Runck, Robin B., 4,499,640, Cl. 29-25.410.
Fathauer, George H.; Hood, Charles F.; and Runck, Robin B., 4,499,767, Cl. 73-304.00C.
Rundo, John R., to BF Goodrich Company, The. Method of retro-fitting windows. 4,499,703, Cl. 52-746.000.
Ruoff, Eugen: *See*—
Bindel, Rudolf; and Ruoff, Eugen, 4,500,100, Cl. 277-235.00B.
Rusboldt, Timothy C. Ice bearing assembly. 4,500,215, Cl. 384-319.000.
Russell, Robert J., to Mail-Ex Corporation. Semi-automatic insertion machine for envelopes. 4,499,705, Cl. 53-266.00A.
Rychnovsky, Raymond E.: *See*—
Jacobson, Albin K.; Rychnovsky, Raymond E.; and Visbeck, Cornelius N., 4,499,829, Cl. 102-378.000.
Rye, Palle: *See*—
Bradley, Wilson E., Jr.; and Rye, Palle, 4,500,330, Cl. 55-257.0PV.
Ryman Engineering Company: *See*—
Fatula, James J., Sr.; and Carroll, Martin J., 4,499,693, Cl. 51-322.000.
S.I.C.A. Pulposec de Chevrieres: *See*—
Berry, Jean-Luc, 4,499,823, Cl. 100-121.000.
S.N.E.C.M.A.: *See*—
Kervistin, Robert; Lardellier, Alain M. J.; Mazeaud, Georges; and Crozet, Francois E. G., 4,500,143, Cl. 384-467.000.
Sadeh, Yaacov: *See*—
Porat, Chaim; and Sadeh, Yaacov, 4,500,873, Cl. 340-515.000.
Sagami Chemical ResearchCenter: *See*—
Kondo, Kiyoshi; and Matsui, Kiyohide, 4,500,733, Cl. 562-506.000.
Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; and Kamochi, Atsumi, to Nihon Tokushu Noyaku Seizo K.K. Substituted phenoxypropionates and herbicidal compositions containing same and their herbicidal use. 4,500,346, Cl. 71-94.000.
Saito, Junichi: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, 4,500,342, Cl. 71-93.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Nogami, Susumu; and Suzuki, Yukio, to Nippon Soken, Inc.; and

Toyota Jidosha Kabushiki Kaisha. System for controlling air-fuel ratio in internal combustion engine. 4,499,882, Cl. 123-492.000.

Saito, Seiji: *See*—
Koumura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, 4,500,918, Cl. 358-75.000.

Saito, Tsutomu: *See*—
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Nogami, Susumu; and Suzuki, Yukio, 4,499,882, Cl. 123-492.000.

Sakagami, Seiji: *See*—
Sakamoto, Hitoshi; Sakagami, Seiji; and Nagashima, Shigeru, 4,500,097, Cl. 277-59.000.

Sakai, Kiyoshi: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,500,619, Cl. 430-59.000.

Sakai, Yukio: *See*—
Tanaka, Toru; Hataya, Masanori; Tanaka, Kazuo; Sakai, Yukio; and Hamada, Yasufumi, 4,500,730, Cl. 562-416.000.

Sakakibara, Yasuyuki: *See*—
Igashira, Toshihiko; Tanaka, Taro; and Sakakibara, Yasuyuki, 4,499,878, Cl. 123-478.000.

Sakamoto, Eiichi; Kawasaki, Mikio; Ono, Kouji; Fukuoji, Kakujulo; and Fujimori, Noboru, to Konishiroku Photo Industry Co., Ltd. Radiographic image forming process. 4,500,631, Cl. 430-413.000.

Sakamoto, Hitoshi; Sakagami, Seiji; and Nagashima, Shigeru, to Mitutoyo Mfg. Co., Ltd. Seal device in displacement measuring instrument. 4,500,097, Cl. 277-59.000.

Sakamura, Yoshikazu; and Majima, Mitsue. Blind nut fastening method. 4,499,647, Cl. 29-509.000.

Sakanoue, Akira: *See*—
Kita, Yasushi; Moroi, Shirou; Sakanoue, Akira; and Nakano, Hisaji, 4,500,678, Cl. 252-58.000.

Sakanoue, Kei; Yagihara, Morio; Ichijima, Seigi; and Nagao, Kimitoshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,500,634, Cl. 430-544.000.

Sakuma, Kiyoshi: *See*—
Matsuoka, Fumio; Iijima, Hitoshi; Yamazaki, Kisuke; Kasagi, Hiroshi; Nakashima, Yasuo; Sakuma, Kiyoshi; and Umehara, Mitsuo, 4,499,739, Cl. 62-212.000.

Sakura, Yasuhiro; Takai, Yoshihiro; and Suzuki, Michio, to Tokyo Electric Co., Ltd. Thermal-printing device with defective resistive heating element detection mode. 4,500,893, Cl. 346-76.0PH.

Sakurai, Hiromi: *See*—
Ooga, Hirotomo; and Sakurai, Hiromi, 4,499,657, Cl. 29-578.000.

Sakurai, Jinichi: *See*—
Sugimoto, Norihiko; Hamada, Nobuhiro; Masuda, Ikuro; and Sakurai, Jinichi, 4,500,951, Cl. 364-186.000.

Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,500,983, Cl. 369-77.200.

Sala, Alberto: *See*—
Winters, Giorgio; Sala, Alberto; and Barone, Domenico, 4,500,525, Cl. 514-210.000.

Salvati, Patricia: *See*—
Bernardi, Luigi; Temperilli, Aldemio; Ruggieri, Daniela; Arcari, Giuliana; and Salvati, Patricia, 4,500,712, Cl. 546-67.000.

Sammler, Louis S.: *See*—
Taylor, Dale F.; and Sammler, Louis S., 4,500,413, Cl. 204-435.000.

Sampsell, Jeffrey B.: *See*—
Penz, Perry A.; and Sampsell, Jeffrey B., 4,500,171, Cl. 350-320.000.

Sanbe, Mitsuhiro: *See*—
Furukawa, Nobuyuki; and Sanbe, Mitsuhiro, 4,500,478, Cl. 261-52.000.

Sandberg, Karen R.: *See*—
Turbak, Albin F.; Snyder, Fred W.; and Sandberg, Karen R., 4,500,546, Cl. 514-781.000.

Sander, Nat: *See*—
Knepshield, William R.; Ogletree, David D.; and Sander, Nat, 4,499,898, Cl. 128-305.000.

Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; Nakano, Eiichi; and Ishidoshiro, Hiroshi, 4,500,318, Cl. 8-111.000.

Sando, Yoshikazu; Nakano, Eiichi; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Method for desizing, scouring and bleaching textile product. 4,500,318, Cl. 8-111.000.

Sands, Clifton A.: *See*—
Schmidt, John C.; Sands, Clifton A.; and Campbell, Donald N., 4,500,391, Cl. 204-1.00T.

Sandstrom, Kjell: *See*—
Uomala, Vilho; Sandstrom, Kjell; and Matilainen, Jorma, 4,500,092, Cl. 277-12.000.

Sandvik, Leonard E., to Deere & Company. Adjustable seat leveling mechanism. 4,500,062, Cl. 248-371.000.

Sangu, Osamu; and Hotta, Seiko, to Nippondenso Co., Ltd. Method and apparatus for detecting an open circuit in a glow plug group for combination with a glow plug heating control circuit. 4,500,775, Cl. 219-497.000.

Sano, Kenji; Kondo, Syunichi; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Photoconductive compositions comprising an organic photoconductor and a thioamide compound and electrophotographic light-sensitive materials using the compositions. 4,500,623, Cl. 430-83.000.

Sanofi, S.A.: *See*—
Frehel, Daniel; Maffrand, Jean-Pierre; and Vallee, Eric, 4,500,534, Cl. 514-301.000.

Santrade Ltd.: *See*—
Trotter, Donald J., 4,500,765, Cl. 219-73.210.

Sardella, Louis M.; and Ward, William F., Sr., to Ward Machinery Company, The. Air lift for blank stackers. 4,500,244, Cl. 414-92.000.

Saruwatari, Minoru: *See*—
Milne, William G.; and Saruwatari, Minoru, 4,499,966, Cl. 182-3.000.

Sasaki, Kouji: *See*—
Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,500,998, Cl. 372-61.000.

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Shimada, Masaru; and Sasaki, Masaomi, 4,500,355, Cl. 106-22.000.

Sasano, Akira: *See*—
Koike, Norio; Tsukada, Toshihisa; Baji, Toru; and Sasano, Akira, 4,500,915, Cl. 358-44.000.

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Miki, Masayuki; Suzuki, Seikou; and Sasayama, Takao, 4,499,880, Cl. 123-489.000.

Sasnett, Michael W.; Hobart, James L.; and Gibson, Larry A., to Coherent, Inc. High power fundamental mode laser. 4,500,996, Cl. 372-19.000.

Satake, Jiro; Arai, Tetsuzo; Tanaka, Kivokazu; Mikami, Eiji; Moriyasu, Tsuneo; and Nakagawa, Tadasu, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha; and Nippon Paint Kabushiki Kaisha. Metal pipe coated with thermoplastic synthetic resin. 4,500,577, Cl. 428-36.000.

Sato, Akihiro: *See*—
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Sato, Akihiro, 4,500,682, Cl. 525-240.000.

Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Inai, Yuichi; Kohara, Yoshiyuki; Kawakami, Yoshiyuki; and Tsurugi, Tomio, to Eisai Co., Ltd.; and Agency of Industrial Science & Technology. Polyprenyl carboxylic acid derivatives. 4,500,463, Cl. 260-406.000.

Sato, Hachiro, to Fukoku Kogyo Company Limited. Continuous press. 4,499,822, Cl. 100-117.000.

Sato, Hideo: *See*—
Horie, Seiji; Nakano, Junji; Nagata, Masayoshi; and Sato, Hideo, 4,500,622, Cl. 430-78.000.
Sano, Kenji; Kondo, Syunichi; and Sato, Hideo, 4,500,623, Cl. 430-83.000.

Sato, Kozo: *See*—
Naito, Hideki; Hara, Hiroshi; Aono, Toshiaki; Sato, Kozo; and Fujita, Shinsaku, 4,500,626, Cl. 430-203.000.

Sato, Masaaki, to Olympus Optical Co., Ltd. Car stereo set. 4,501,013, Cl. 381-86.000.

Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Method for forming magenta color image. 4,500,630, Cl. 430-386.000.

Sato, Tetsuo; and Kominami, Yasuo, to Hitachi, Ltd. Signal processing circuit. 4,500,932, Cl. 360-65.000.

Sauer, Rudolf: *See*—
Romann, Peter; Sauer, Rudolf; and Steinrucken, Heinrich, 4,500,866, Cl. 338-126.000.

Savioli, Giulio V., to United States of America, Army. Auxiliary trigger for firearm. 4,499,683, Cl. 42-69.00R.

Sawa, Buntaro; and Honda, Naoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Plural phase lock loop signal regeneration circuit. 4,500,851, Cl. 331-2.000.

Sawada, Tadashi: *See*—
Kiryu, Yuichi; and Sawada, Tadashi, 4,500,251, Cl. 414-719.000.

Sbrizzai, Marino. Hydraulic machine. 4,499,725, Cl. 60-506.000.

Scales, Michael J., to Nicolon Corporation. Articulated mat revetment assembly machine. 4,499,664, Cl. 29-714.000.

Scelba, Stephen S.: *See*—
Bako, Lazlo; and Scelba, Stephen S., 4,499,681, Cl. 42-1.00Y.

Schaefer, Karl P.: *See*—
Downing, Gerald T.; and Schaefer, Karl P., 4,500,223, Cl. 402-20.000.

Schafer, Otmar U. Apparatus having a dryer for organic substances. 4,499,943, Cl. 165-95.000.

Schaff, Fredrick L.; and Gottlieb, Milton, to Westinghouse Electric Corp. Method and apparatus for light chopping by acousto-optic refraction. 4,500,175, Cl. 350-358.000.

Schaffner, John P.: *See*—
Sundberg, Jack G.; Schaffner, John P.; and Conlon, Daniel J., 4,500,268, Cl. 418-1.000.

Schaller, Albert R. Centrifugal brake device, especially for the automatic winding of an electrical cable. 4,500,048, Cl. 242-107.300.

Schebler, Bernard J., to Litton Systems, Inc. Selector valve for an aircraft on board oxygen generation system with high pressure oxygen backup. 4,499,914, Cl. 137-81.100.

Scheiner, David: *See*—
Kadison, Sylvan; and Scheiner, David, 4,500,552, Cl. 426-96.000.

Scheller, Andor, to Exxon Research & Engineering Co. Pass through stretch wrapping process. 4,499,706, Cl. 53-399.000.

Schemmann, Hugo; and Bertram, Leo, to U.S. Philips Corporation. Self-starting single-phase synchronous motor. 4,500,825, Cl. 318-792.000.

Scher, Herbert B., to Stauffer Chemical Company. Microencapsulated chelating agents and their use in removing metal ions from aqueous solutions. 4,500,494, Cl. 423-24.000.

Schering Aktiengesellschaft: *See*—
Nickisch, Klaus; Bittler, Dieter; Laurent, Henry; Wiechert, Rudolf; and Losert, Wolfgang, 4,500,522, Cl. 514-173.000.

Schijve, Jacobus; Vogelesang, Laurens B.; and Marissen, Roelof, to Technische Hogeschool Delft. Laminate of aluminum sheet material and aramid fibers. 4,500,589, Cl. 428-213.000.

Schirmer, Ulrich: *See*—
Becker, Rainer; Theobald, Hans; Schirmer, Ulrich; Spiegler, Wolfgang; Seufert, Walter; and Wuerzer, Bruno, 4,500,340, Cl. 71-90.000.

Schisler, Robert C.; and Eisenzimmer, George W., to Goodyear Tire & Rubber Company, The. Inflatable oil well hole plug with reinforcing wires. 4,500,095, Cl. 277-34.000.

Schlegel Lining Technology GmbH: *See*—
Hammer, Heiner I., 4,499,923, Cl. 138-109.000.

Schletzbaum, John W.: *See*—
Jacobi, Stephen F.; Haight, Robert E.; Schletzbaum, John W.; Martin, Yolanda E.; and Lang, Stephen P., 4,500,874, Cl. 340-607.000.

Schlumberger Technology Corporation: *See*—
Nguyen, Khoi B., 4,500,156, Cl. 339-94.00C.

Schmalfeld, Erwin: *See*—
Vock, Jurgen; Piack, Peter; Lange, Norbert; Schmalfeld, Erwin; and Petersen, Kurt-Eckard, 4,500,770, Cl. 219-121.0LK.

Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, to EVG Entwicklungs- u. Verwertungs-Gesellschaft m.b.H. Method and apparatus for the production of welded grid bodies. 4,500,763, Cl. 219-58.000.

Schmidt, John C.; Sands, Clifton A.; and Campbell, Donald N., to Allied Corporation. Method of and system for real time differential pulse detection. 4,500,391, Cl. 204-1.00T.

Schmidt, Manfred; Witman, Mark W.; Reinert, Gerard E.; and Lim, In C., to Mobay Chemical Corporation. Blowing agents for thermoplastic compositions. 4,500,653, Cl. 521-90.000.

Schmidt, Peter C.: *See*—
Krug, Russell R.; and Schmidt, Peter C., 4,500,423, Cl. 208-161.000.

Schmidt, Robert R.: *See*—
Forster, Heinz; Eue, Ludwig; and Schmidt, Robert R., 4,500,341, Cl. 71-92.000.

Schmidt, William P.; and Hutchinson, Franklin D. Fender mount for a mirror. 4,500,063, Cl. 248-475.100.

Schmitz, Herman J. R., to U.S. Philips Corporation. Device for displaying digital information incorporating selection of picture pages and/or resolution enhancement. 4,500,875, Cl. 340-703.000.

Schneider, Earl L. Broom handle holding attachment for an industrial broom. 4,499,626, Cl. 15-146.000.

Schnell, Heinrich. Apparatus for winding bolts of cloth or the like. 4,500,044, Cl. 242-56.00A.

Scholl, Frederick W.; and Coden, Michael H., to Codenoll Technology Corporation. Method and apparatus for aligning optical fibers. 4,500,165, Cl. 350-96.200.

Schonhut, Kurt, to Ferdinand Menrad, Firma. Side bridge for metal spectacles. 4,500,179, Cl. 351-137.000.

Schore, George: *See*—
D'Agostino, Vincent F.; Lee, Joseph Y.; Zapisek, Stephen; and Schore, George, 4,500,396, Cl. 204-107.000.

Schoumaker, Raoul J. P.: *See*—
Anderson, William C.; Boundy, Bruce K.; and Schoumaker, Raoul J. P., 4,500,060, Cl. 248-349.000.

Schouten, Henry G., to American Home Products Corporation. Preparation of alkoxy methyl ethers. 4,500,738, Cl. 568-433.000.

Schreiber, William F., to Massachusetts Institute of Technology. Color reproduction system. 4,500,919, Cl. 358-78.000.

Schreyegg, Otmar: *See*—
Baumann, Theodor; and Schreyegg, Otmar, 4,499,699, Cl. 52-169.100.

Schuller, James T., to UMC Industries, Inc. Vendor change return control. 4,499,985, Cl. 194-10.000.

Schultze, Eckart F.: *See*—
Barber, Ralph R.; and Schultze, Eckart F., 4,500,069, Cl. 251-282.000.

Schulz, David W.; and Spaulding, Gail E., to Rockwell International Corporation. Method for expelling entrapped air from reactive metallic layups prior to diffusion bonding. 4,500,033, Cl. 228-219.000.

Schumacher, Berthold W. Fluid flow energy converter. 4,500,259, Cl. 416-122.000.

Schumann, Klaus: *See*—
Grunert, Heinz; Hahn, Fritz; Rall, Ulrich; Schumann, Klaus; Schwuger, Milan J.; and Smolka, Heinz G., 4,500,320, Cl. 8-442.000.

Schumann, Robert W., to Nicolet Instrument Corporation. Photoplotter. 4,500,182, Cl. 354-4.000.

Schustek, Siegfried: *See*—
Ahner, Peter; Harer, Helmut; and Schustek, Siegfried, 4,500,772, Cl. 219-209.000.

Schutz, Rudolph W.: *See*—
Reba, Imants; Schutz, Rudolph W.; and Kozbur, Nestor, 4,499,801, Cl. 83-24.000.

Schutz, Udo. Wide-necked container of a synthetic resin with removable lid. 4,500,010, Cl. 220-320.000.

Schwuger, Milan J.: *See*—
Grunert, Heinz; Hahn, Fritz; Rall, Ulrich; Schumann, Klaus; Schwuger, Milan J.; and Smolka, Heinz G., 4,500,320, Cl. 8-442.000.

Scott, Gary L., to Western Geophysical Co of America. Optical seismic transducer. 4,500,979, Cl. 367-149.000.

Scragg, Edgar P., to Prima Valves International (Proprietary) Limited. Plant watering device. 4,499,686, Cl. 47-48.500.

Secrist, Duane R.: *See*—
Clark, James M.; Secrist, Duane R.; Hardin, Scotty L.; and McEntyre, Stephen C., 4,500,401, Cl. 204-225.000.

Seguchi, Hiroshi: *See*—
Yoshida, Yasuharu; Seguchi, Hiroshi; and Tagashira, Yoshimi, 4,501,004, Cl. 375-102.000.

Seim, Albert D., II: *See*—
Dyett, Derek H.; Wood, Godfrey A.; and Seim, Albert D., II, 4,499,910, Cl. 131-95.000.

Seipke, Gerhard; Tripier, Dominique; and Johnscher, Gerd, to Hoechst Aktiengesellschaft. Polypeptide having an action on the immunological system, process for its isolation and purification, its use, agents containing this compound, and its cleavage products, their use and agents containing these products. 4,500,450, Cl. 260-112.00R.

Seismograph Service Corporation: *See*—
Ziolkowski, Antoni M.; and Lerwill, William E., 4,500,978, Cl. 367-142.000.

Sellers, Ralph F.: *See*—
King, John J.; Sellers, Ralph F.; and Castonguay, Richard N., 4,500,582, Cl. 428-116.000.

Senes, Michel: *See*—
Denise, Bernard; Hamon, Christian; Senes, Michel; and Sneeden, Raymond, 4,500,646, Cl. 502-78.000.

Senshu, Takao: *See*—
Kuroda, Shigeaki; Senshu, Takao; Oguni, Kensaku; Mochizuki, Taketoshi; Yasuda, Hiromu; Ishibane, Kyuhei; Atsumi, Akira; Kimura, Hideyuki; and Hatada, Toshio, 4,500,035, Cl. 236-92.00B.

Seppamaki, John W. Flue control device. 4,499,891, Cl. 126-292.000.

Sepulveda, Luis F., to Challenger Caribbean Corporation; Challenger Zinsco, Inc.; and Commander Electrical Equipment, Inc. Circuit breaker having an integrated power trap arm. 4,500,863, Cl. 337-70.000.

Seragnoli, Enzo, to G.D Societa' per Azioni. Cigarette manufacturing machine. 4,499,909, Cl. 131-84.00R.

Sermersheim, DeWayne T.; and Baxter, Jack L., to Cummins Engine Company, Inc. Idler mechanism. 4,500,303, Cl. 474-112.000.

Seufert, Walter: *See*—
Becker, Rainer; Theobald, Hans; Schirmer, Ulrich; Spiegler, Wolfgang; Seufert, Walter; and Wuerzer, Bruno, 4,500,340, Cl. 71-90.000.

Sevenson Company: *See*—
Steiner, Marvin B.; and Steiner, Roy I., 4,500,209, Cl. 366-157.000.

Seyfried, Christoph: *See*—
Hausberg, Hans-Heinrich; Uhl, Jurgen; Seyfried, Christoph; and Minck, Klaus-Otto, 4,500,541, Cl. 514-466.000.

Shahrokh-Khani, Jane A., executor: *See*—
Weissenbach, Joseph, deceased; and Shahrokh-Khani, Jane A., executor, 4,499,885, Cl. 123-525.000.

Shakertown Corporation: *See*—
Bockwinkel, Joe L.; and Pehl, Willis G., 4,499,701, Cl. 52-555.000.

Shank, Joseph L., to DynaGel Incorporated. Cross-linked protein composition using aluminum salts of acetic acid. 4,500,453, Cl. 260-117.000.

Shanklin, James R., Jr.; and Johnson, Christopher P., III, to A. H. Robins Company, Incorporated. Method of treating cardiac disorders with N-(aryloxyalkyl)-N'-(aminoalkyl)ureas. 4,500,529, Cl. 514-235.000.

Shanley, Charles W.; and Braun, William V., to Motorola, Inc. Simplex transceiver employing a common piezoelectric element for transmitting and receiving. 4,501,018, Cl. 455-83.000.

Sharp Die & Mold Company, Inc., a subsidiary of R & R Plastic Material, Inc.: *See*—
Ruhl, Edward A., 4,500,275, Cl. 425-192.00R.

Sharp Kabushiki Kaisha: *See*—
Hashimoto, Shintaro; Masuzawa, Sigeaki; Shibata, Shinya; Tsuda, Hiroshi; and Nakano, Masahiro, 4,500,211, Cl. 368-63.000.
Watanabe, Takashi; and Miyatake, Shigehiro, 4,500,914, Cl. 358-44.000.

Shea, Dennis W.: *See*—
Kaminski, David C.; and Shea, Dennis W., 4,499,980, Cl. 192-35.000.

Shedd, Harold E. Power source isolator. 4,500,862, Cl. 337-32.000.

Shell Oil Company: *See*—
Ayers, Ray R.; and Kipp, Robert M., 4,500,117, Cl. 285-3.000.
Ayers, Ray R., 4,500,151, Cl. 339-59.00R.
Blytas, George C., 4,500,333, Cl. 62-17.000.
Pilgram, Kurt H.; and Price, Thomas P., 4,500,345, Cl. 71-93.000.
van Dongen, Robert H.; and Stork, Willem H. J., 4,500,416, Cl. 208-86.000.

Sheridan, Dan P.: *See*—
McKinley, Mark J.; and Sheridan, Dan P., 4,500,670, Cl. 524-445.000.

Sherman, Charles F., to Nielsen Moulding Design Corporation. Anti-theft frame hanging system. 4,499,679, Cl. 40-152.100.

Shiba, Keisuke; Yazawa, Hiromi; Ohishi, Chikashi; and Nakao, Sho, to Fuji Photo Film Co., Ltd. Electrophotographic process for producing printing plate and plate making machine. 4,500,618, Cl. 430-49.000.

Shiba, Nobuyasu: *See*—
Hayashi, Yutaka; Yamanaka, Mithuyuki; Iida, Hideyo; Shiba, Nobuyasu; Karasawa, Hideyuki; Mishuku, Toshio; and Itou, Atsuo, 4,500,743, Cl. 136-258.000.

Shibata, Shinya: *See*—
Hashimoto, Shintaro; Masuzawa, Sigeaki; Shibata, Shinya; Tsuda, Hiroshi; and Nakano, Masahiro, 4,500,211, Cl. 368-63.000.

Shibata, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Stacked semiconductor device with sloping sides. 4,500,905, Cl. 357-68.000.
Shibata, Toshihiro: *See—*
Minagawa, Motonobu; Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,500,663, Cl. 524-101.000.
Shih, Kelvin: *See—*
Hochstein, Peter A.; and Shih, Kelvin, 4,500,795, Cl. 307-141.000.
Shima, Seiya: *See—*
Tsuboi, Nobuyoshi; Shima, Seiya; Kanasaki, Morio; and Nakazawa, Hayashi, 4,499,986, Cl. 198-322.000.
Shima, Toshiaki; Hamamuro, Naozi; Ikari, Shinichi; and Fuzishiro, Tuneo, to Shin-Kobe Electric Machinery Co., Ltd. Process of producing a plate for a lead storage battery. 4,499,929, Cl. 141-1.100.
Shimada, Masaru; and Sasaki, Masaomi, to Ricoh Company, Ltd. Aqueous ink composition. 4,500,355, Cl. 106-22.000.
Shimamune, Takayuki: *See—*
Asano, Hisoshi; Shimamune, Takayuki; Goto, Toshiki; and Hosonuma, Masashi, 4,500,405, Cl. 204-290.00F.
Shimano, Shizuo: *See—*
Yoshida, Hiroshi; Koike, Kengo; Shimano, Shizuo; Nakagawa, Taizo; and Ohmori, Kaoru, 4,500,536, Cl. 514-397.000.
Shimbo, Osamu; Nguyen, Lan N.; and Dicks, Jack L., to International Telecommunications Satellite Organization. Equalizer for reducing crosstalk between two FDM/FM carriers in a satellite communications system. 4,500,984, Cl. 370-6.000.
Shimizu, Akira: *See—*
Kasuga, Muneo; Shimizu, Akira; and Nishio, Tadashi, 4,500,199, Cl. 355-14.0CU.
Shimizu, Isao, to Hitachi, Ltd. Emitter ballast resistor configuration. 4,500,900, Cl. 357-36.000.
Shimizu, Senzo; Nomura, Isao; Yamamiya, Kazuo; and Masuda, Tsuneaki, to Mitsubishi Gas Chemical Company, Inc. Resin composition for molding materials. 4,500,668, Cl. 524-427.000.
Shimizu, Yukiharu: *See—*
Niwa, Toshio; Hihara, Toshio; and Shimizu, Yukiharu, 4,500,455, Cl. 534-635.000.
Shimotsuma, Wataru: *See—*
Hotta, Shu; Hosaka, Tomiharu; and Shimotsuma, Wataru, 4,500,459, Cl. 260-396.00N.
Shimura, Akira, to Ricoh Company, Ltd. Photoconductive element cleaning apparatus and residual toner collecting apparatus. 4,500,196, Cl. 355-3.0DD.
Shimura, Akira: *See—*
Tomita, Satoru; Shimura, Akira; and Yokota, Takashi, 4,499,849, Cl. 118-652.000.
Shin-Kobe Electric Machinery Co., Ltd.: *See—*
Shima, Toshiaki; Hamamuro, Naozi; Ikari, Shinichi; and Fuzishiro, Tuneo, 4,499,929, Cl. 141-1.100.
Shinryo Air Conditioning Co., Ltd.: *See—*
Suzuki, Akira; Shioya, Yasumi; Watanabe, Norio; and Kimura, Keiichi, deceased, 4,500,427, Cl. 210-608.000.
Shioji, Shorbu: *See—*
Takehara, Hidetoshi; Shioji, Shorbu; and Nakagawa, Yohichi, 4,500,693, Cl. 526-240.000.
Shiokawa, Kozo: *See—*
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, 4,500,342, Cl. 71-93.000.
Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; and Kamochi, Atsumi, 4,500,346, Cl. 71-94.000.
Shiomura, Yasuro: *See—*
Ogawa, Masaki; and Shiomura, Yasuro, 4,500,685, Cl. 525-343.000.
Shioya, Yasumi: *See—*
Suzuki, Akira; Shioya, Yasumi; Watanabe, Norio; and Kimura, Keiichi, deceased, 4,500,427, Cl. 210-608.000.
Shipley Company Inc.: *See—*
Castner, B. Christian, 4,499,852, Cl. 118-690.000.
Shirai, Kazunari; and Tanaka, Izumi, to Fujitsu Limited. Semiconductor memory device and process for producing the same. 4,500,899, Cl. 357-23.000.
Shirakura, Toshiharu: *See—*
Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,500,998, Cl. 372-61.000.
Shirato, Takehide, to Fujitsu Limited. Mask ROM-type semiconductor memory device. 4,500,975, Cl. 365-104.000.
Shrivastava, Rituparna, to Mostek Corporation. Method of forming a MOSFET with both improved breakdown resistance and less hot-electron effects. 4,499,652, Cl. 29-571.000.
Shroff, James R.: *See—*
Loev, Bernard; Shroff, James R.; and Desai, Rohit, 4,500,527, Cl. 514-223.000.
Loev, Bernard; Jones, Howard; and Shroff, James R., 4,500,528, Cl. 514-228.000.
Shuck, Robert E.: *See—*
Elander, Robert C.; Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Shuck, Robert E.; and Tuchman, Walter L., 4,500,750, Cl. 178-22.080.
Shuey, Kenneth C.; and Doughman, Charles L., to Westinghouse Electric Corp. Detection of DC content in an AC waveform. 4,500,837, Cl. 324-102.000.
Shulman, Cindy B., to Exxon Research & Engineering Co. Thermoplastic blend of polyolefin, isobutylene-backbone elastomer and ethylene copolymer. 4,500,681, Cl. 525-222.000.
Shultz, Richard E.: *See—*
Rayfield, Wilson P.; Peter, Emmett B., III; and Shultz, Richard E., 4,500,085, Cl. 271-207.000.
Shum, Lanson Y., to Westinghouse Electric Corp. Split-ball type wrist and manipulating assembly for robot. 4,499,784, Cl. 74-479.000.
Shumate, Michael E.: *See—*
Rudell, Elliot A.; Shumate, Michael E.; and Cernansky, Joseph S., 4,500,104, Cl. 280-289.00D.
Sibley, James N. Support means for a rotating frame animal body trap. 4,499,685, Cl. 43-96.000.
Sick, Erwin, to Erwin Sick GmbH Optik-Elektronik. Apparatus for seeking faults in wide material webs. 4,500,208, Cl. 356-431.000.
Sidorenko, Georgy I.; Lopato, Georgy P.; Yakubovich, Vladimir M.; Nikitin, Yaroslav G.; Usachev, Oleg I.; and Vorobiev, Anatoly P., to Belorussky Nauchnoissledovatelsky Institut Kardiologii. Heart monitoring device. 4,499,904, Cl. 128-703.000.
Siedle, Allen R., to Minnesota Mining and Manufacturing Company. Palladium (II) bis (hexafluoroacetylacetonate), adducts derived therefrom and uses thereof. 4,500,569, Cl. 427-304.000.
Siegfried, Peter; and Wenger, Martin, to Kraftwerk Union Aktiengesellschaft. Process for the gasification of raw carboniferous materials. 4,500,323, Cl. 48-197.00R.
Siemens Aktiengesellschaft: *See—*
Fladerer, Heinrich, 4,500,992, Cl. 370-100.000.
Grassme, Ulrich, 4,501,010, Cl. 378-38.000.
Herberg, Helmut, 4,500,902, Cl. 357-38.000.
Kirner, Wilhelm, 4,500,894, Cl. 346-140.00R.
Knott, Joseph, 4,500,194, Cl. 355-3.0DD.
Kunze, Dieter, 4,500,166, Cl. 350-96.200.
Wohlgemuth, Juergen; and Hohmann, Eugen, 4,499,906, Cl. 128-776.000.
Zeitraeg, Rolf, 4,500,869, Cl. 340-347.0DD.
SIG Schweizerische Industrie-Gesellschaft: *See—*
Gasser, Markus, 4,499,988, Cl. 198-369.000.
Silva, Roy F., to Stauffer Chemical Company. Fermentation aid for conventional baked goods. 4,500,548, Cl. 426-19.000.
Simo, Thomas; Eisenlohr, Karl-Heniz; and Puxbaumer, Hans-Hermann, to Metallgesellschaft Aktiengesellschaft. Process of converting non-distillable residues of mixed-base or paraffin-base crude hydrocarbon oils. 4,500,415, Cl. 208-56.000.
Simon, Jaime; Crump, Druce K.; and Wilson, David A., to Dow Chemical Company, The. Metal ion control compounds based on norbornane. 4,500,469, Cl. 260-502.50E.
Simon, Jaime: *See—*
Crump, Druce K.; Simon, Jaime; and Wilson, David A., 4,500,356, Cl. 106-90.000.
Simpson, Howard D.; Richardson, Ryden L.; and Baron, Kenneth, to Union Oil Company of California. Desulfurization catalyst and process. 4,500,424, Cl. 208-216.0PP.
Simpson, Jack R., to Container Graphics Corporation. Rotary cutting die with scrap ejection. 4,499,802, Cl. 83-117.000.
Singer Company, The: *See—*
Blackwood, John; Graham, Thomas G.; and Brauch, Robert B., 4,499,839, Cl. 112-317.000.
Burns, Richard H.; Hall, William M.; and Hildebrand, Bernard P., 4,500,163, Cl. 350-3.700.
Rasmussen, Donald C., deceased; and Kozel, James A., deceased, 4,500,068, Cl. 251-205.000.
Voza, Alfonse N., 4,499,838, Cl. 112-266.100.
Wojtanek, Guy A., 4,500,212, Cl. 368-108.000.
Singer, Debra L.; McCollum, Gregory J.; Dowbenko, Rostyslaw; and O'Dwyer, James B., to PPG Industries, Inc. Aromatic acid catalysts providing improved humidity resistance. 4,500,680, Cl. 525-143.000.
Sioux Technology, Inc.: *See—*
Peterson, Richard R., 4,500,146, Cl. 312-257.0SM.
Skach, Edward J., Jr., to Dow Chemical Company, The. Production of round salt coated metal granules. 4,500,349, Cl. 75-0.50B.
Skarka, Josef: *See—*
Junek, Jan; Skarka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Hacova, Kveta; Vobornik, Vaclav; Ohlidal, Vladimi; and Lihtarova, Ludmila, 4,499,718, Cl. 57-301.000.
Skinner, Dewey F.: *See—*
Hill, Richard W.; Skinner, Dewey F.; and Thorsness, Charles B., 4,499,945, Cl. 166-50.000.
Skinner, Robert T. J., to Lucas Industries Public Limited Company. Fuel injection pumps. 4,499,884, Cl. 123-506.000.
Skwor, Edward P., to Minnesota Mining and Manufacturing Company. Bone stapler. 4,500,025, Cl. 227-19.000.
SL Industries, Inc.: *See—*
Hammill, S. Scott, 4,500,152, Cl. 339-61.00M.
Slaten, Gary G., to Discovision Associates. Stamper and method for injection molding information bearing member. 4,500,392, Cl. 204-5.000.
Slater Electric Inc.: *See—*
Meehan, James E., 4,500,746, Cl. 174-48.000.
Slovenska vysoka skola technika: *See—*
Tkac, Alexander; and Cvengros, Jan, 4,500,390, Cl. 159-6.100.
Smith, David C.; and Noto, Richard, to United States of America, Army. Automatic layout program for hybrid microcircuits (HYPAR). 4,500,963, Cl. 364-300.000.
Smith, Donald W., to Gala Industries, Inc. Underwater pelletizer with adjustable blade assembly. 4,500,271, Cl. 425-67.000.
Smith Engineering: *See—*
Smith, Jay, III; and Karr, Gerald S., 4,500,879, Cl. 340-739.000.
Smith International, Inc.: *See—*
Garrett, William R., 4,499,924, Cl. 138-110.000.
Vezirian, Edward; Quinones, Richard J.; and Lockstedt, Alan W., 4,499,642, Cl. 29-149.50R.

Smith, Jay, III; and Karr, Gerald S., to Smith Engineering. Circuitry for controlling a CRT beam. 4,500,879, Cl. 340-739.000.
Smith, Kenneth M. Universal framing layout tool. 4,499,666, Cl. 33-174.00B.
Smith, Lilburn R.: *See—*
Cottle, Wilbur W., Jr.; and Smith, Lilburn R., 4,500,051, Cl. 244-3.160.
Smith, Lonnie M., to Durbin-Durgo, Inc. Adjustable load binder. 4,500,073, Cl. 254-258.000.
Smith, Richard W., to Wangner Systems Corporation. Dryer fabric having reduced permeability in the area of the pintle joint. 4,500,590, Cl. 428-222.000.
Smith, Robert M.: *See—*
Boys, Donald R.; and Smith, Robert M., 4,500,408, Cl. 204-298.000.
Smith, Terence J.: *See—*
Irving, Edward; and Smith, Terence J., 4,500,629, Cl. 430-325.000.
Smith, Thomas M. Infra-red generators and use. 4,500,283, Cl. 431-328.000.
Smolka, Heinz G.: *See—*
Grunert, Heinz; Hahn, Fritz; Rall, Ulrich; Schumann, Klaus; Schwuger, Milan J.; and Smolka, Heinz G., 4,500,320, Cl. 8-442.000.
Smyers, William H., Jr.: *See—*
Greenberg, Mishel; Smyers, William H., Jr.; and Chernack, Milton, 4,499,905, Cl. 128-727.000.
Smyth, Bruce E., to Itek Corporation. Printed circuit board defect detection of detecting maximum line width violations. 4,500,202, Cl. 356-237.000.
Snamprogetti S.p.A.: *See—*
Lagana', Vincenzo; and Cavallanti, Virginio, 4,500,734, Cl. 564-72.000.
Sneeden, Raymond: *See—*
Denise, Bernard; Hamon, Christian; Senes, Michel; and Sneeden, Raymond, 4,500,646, Cl. 502-78.000.
Snow, William R.: *See—*
Ellenberger, Charles E.; Bower, George L.; and Snow, William R., 4,500,563, Cl. 427-38.000.
Snyder, Fred W.: *See—*
Turbak, Albin F.; Snyder, Fred W.; and Sandberg, Karen R., 4,500,546, Cl. 514-781.000.
Snyder, Kurt I.: *See—*
Christie, Alan M.; and Snyder, Kurt I., 4,500,487, Cl. 376-283.000.
Societe Alsacienne de Construction de Materiel Textile: *See—*
Faessler, Rene , 4,499,719, Cl. 57-417.000.
Societe Anonyme D.B.A.: *See—*
Pressaco, Pierre; and Carre , Jean-Jacques, 4,499,812, Cl. 91-376.00R.
Tanguy, Christian, 4,499,922, Cl. 137-625.240.
Societe Chimique de la Grande Paroisse, Azote et Producits Chimiques: *See—*
Denise, Bernard; Hamon, Christian; Senes, Michel; and Sneeden, Raymond, 4,500,646, Cl. 502-78.000.
Societe Europeenne de Propulsion: *See—*
Brunet, Maurice, 4,500,142, Cl. 308-10.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Duwelz, Alain J., 4,500,057, Cl. 244-161.000.
Soeno, Ko: *See—*
Onuki, Jin; Soeno, Ko; Morita, Keiichi; and Onodera, Hisakithi, 4,500,904, Cl. 357-67.000.
Tsuchiya, Masatoshi; Soeno, Ko; and Yoshida, Tomomasa, 4,499,774, Cl. 73-727.000.
Sok, Brian A.: *See—*
Kim, Yong-Wu; Coduti, Phillip L.; Sok, Brian A.; and Carter, William A., 4,500,561, Cl. 427-25.000.
Sole, Carlos M.; and Vallvey, Juan A., to Colores Hispania, S.A. Process for the preparation of treated lead chromate based pigments. 4,500,361, Cl. 106-298.000.
Solomon, Frank, to Diamond Shamrock Chemicals Company. Three layer laminated matrix electrode. 4,500,647, Cl. 502-101.000.
Sommer, Karl H.; Sonntag, Alois; and Pikorz, Wolfgang, to Licentia Patent-Verwaltungs-G.m.b.H. Thyristor having n^+- main and auxiliary emitters and a p^+ ring forming a p^+n^+ junction with the main emitter. 4,500,901, Cl. 357-38.000.
Sonntag, Alois: *See—*
Sommer, Karl H.; Sonntag, Alois; and Pikorz, Wolfgang, 4,500,901, Cl. 357-38.000.
Sony Corporation: *See—*
Immink, Kornelis A.; Nijboer, Jakob G.; Ogawa, Hiroshi; and Odaka, Kentaro, 4,501,000, Cl. 375-25.000.
Mori, Toshio, 4,500,397, Cl. 204-181.00T.
Tajima, Shigeru; Okada, Hiroshi; and Nakano, Kenji, 4,500,822, Cl. 318-314.000.
Takeuchi, Tetsuo, 4,499,662, Cl. 29-622.000.
Yoshida, Tadao, 4,500,982, Cl. 369-50.000.
Sottolana, Giulio. Shoe bottom for general footwear including heel, instep, plantar, support and insole. 4,499,671, Cl. 36-24.500.
Spanset Inter AG: *See—*
van de Kamp, Dieter, 4,500,578, Cl. 428-36.000.
Spaulding, Gail E.: *See—*
Schulz, David W.; and Spaulding, Gail E., 4,500,033, Cl. 228-219.000.
Spease, Arthur L.: *See—*
Bennett, William G.; and Spease, Arthur L., 4,499,785, Cl. 74-501.00R.
Specht, Theodore R.; and Cham, Edward J., to Westinghouse Electric Corp. Advance and retard phase-shift transformer. 4,500,829, Cl. 323-215.000.
Spector, Dov; and Spector, Yehiel. Fire and explosion detection and suppression system and actuation circuitry therefor. 4,499,952, Cl. 169-61.000.
Spector, Yehiel: *See—*
Spector, Dov; and Spector, Yehiel, 4,499,952, Cl. 169-61.000.
Spectrospin AG: *See—*
Allemann, Martin; and Kellerhals, Hanspeter, 4,500,782, Cl. 250-291.000.
Spencer Wright Industries, Inc.: *See—*
Ingram, Gary L., 4,499,835. Cl. 112-79.00R.
Sperry Corporation: *See—*
Bennett, Donald B.; Thorsrud, Lee T.; and Petschauer, Thomas W., 4,500,988, Cl. 370-85.000.
Fabian, Walter; and Spooner, Frank H., 4,499,656, Cl. 29-576.00E.
Lieu, Dennis K.; and Cooper, Larry, 4,499,736, Cl. 62-3.000.
McLean, Kenneth W., 4,499,711, Cl. 56-13.600.
Murphy, Charles J., 4,500,816, Cl. 315-368.000.
Spiegel, Nikolaus: *See—*
Fischer, Rudolf; and Spiegel, Nikolaus, 4,499,760, Cl. 73-159.000.
Spiegler, Wolfgang: *See—*
Becker, Rainer; Theobald, Hans; Schirmer, Ulrich; Spiegler, Wolfgang; Seufert, Walter; and Wuerzer, Bruno, 4,500,340, Cl. 71-90.000.
Spitzer, Wayne A.; and Goodson, Theodore, Jr., to Eli Lilly and Company. Preparation of 4-fluoroazetidinones using $FClO_3$. 4,500,456, Cl. 260-239.00A.
Sponhnholtz, Michael A.: *See—*
Darland, Michael L.; Stoner, Donald L.; Baker, James W., Jr.; and Sponhnholtz, Michael A., 4,500,751, Cl. 179-2.0DP.
Spooner, Frank H.: *See—*
Fabian, Walter; and Spooner, Frank H., 4,499,656, Cl. 29-576.00E.
Sprague Electric Company: *See—*
Maher, Galeb H., 4,500,368, Cl. 148-431.000.
Sprague, Peter W.; and Heikes, James E., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptaine prostaglandin intermediates and method for preparing same. 4,500,723, Cl. 549-459.000.
Srivastava, Suresh C.; Fawwaz, Rashid A.; and Richards, Powell, to United States of America, Energy. Radionuclide labeled lymphocytes for therapeutic use. 4,500,508, Cl. 424-1.100.
Stahl, Gunther R., to General Electric Company. Tool holder clamping means. 4,499,800, Cl. 82-36.00R.
Stahl, William L., Jr.: *See—*
Cases, Moises; Kraft, Wayne R.; Stahl, William L., Jr.; and Thoma, Nandor G., 4,500,800, Cl. 307-468.000.
Staiger, M. Daniel, to United States of America, Energy. Valve for controlling solids flow. 4,500,231, Cl. 406-198.000.
Standard Oil Company, The: *See—*
Burrington, James D.; and Blachman, Marc W., 4,500,468, Cl. 260-465.80D.
Jevnikar, Mary G.; and Kuch, Philip L., 4,500,505, Cl. 423-416.000.
Standard Oil Company (Indiana): *See—*
Petty-Weeks, Bruce C.; and Zeitlin, Martin A., 4,500,732, Cl. 562-486.000.
Stephens, James R., 4,500,701, Cl. 528-363.000.
West, C. Thomas; and Basalay, Robert J., 4,500,439, Cl. 252-46.400.
Stanton and Staveley Limited: *See—*
Else, George E.; Millward, Cyril; Dixon, Ronald H. T.; and Jorgensen, Knut, 4,500,352, Cl. 75-130.00B.
Staudacher, George E., to Pacific Western Systems, Inc. Automatic wafer prober with programmable tester interface. 4,500,836, Cl. 324-73.0AT.
Stauffer Chemical Company: *See—*
Bender, Fredric G.; Everson, Charles W.; and Swartz, William E., 4,500,559, Cl. 426-646.000.
Chang, Pei K., 4,500,454, Cl. 260-123.500.
Edging, Thomas E., 4,500,557, Cl. 426-563.000.
Scher, Herbert B., 4,500,494, Cl. 423-24.000.
Silva, Roy F., 4,500,548, Cl. 426-19.000.
Stechschulte, Theodore J.: *See—*
Keglewitsch, Josef; and Stechschulte, Theodore J., 4,500,161, Cl. 339-242.000.
Keglewitsch, Josef; and Stechschulte, Theodore J., 4,500,162, Cl. 339-252.00F.
Steele, S. Robert: *See—*
Varteresian, Michael G.; and Steele, S. Robert, 4,499,659, Cl. 29-589.000.
Steffan, Leonard D.; and Kohler, Robert D., to Owens-Illinois, Inc. Apparatus for controlling a valve. 4,499,920, Cl. 137-624.150.
Steffens, Bert. Method and apparatus for separating the components of cellulose sanitary articles. 4,500,040, Cl. 241-14.000.
Steiner, Marvin B.; and Steiner, Roy I., to Sevenson Company. Feed mixing apparatus. 4,500,209, Cl. 366-157.000.
Steiner, Roy I.: *See—*
Steiner, Marvin B.; and Steiner, Roy I., 4,500,209, Cl. 366-157.000.
Steinrucken, Heinrich: *See—*
Romann, Peter; Sauer, Rudolf; and Steinrucken, Heinrich, 4,500,866, Cl. 338-126.000.
Stellram GmbH: *See—*
Dehn, Dieter, 4,500,233, Cl. 408-182.000.
Stephens, James R., to Standard Oil Company (Indiana). Co-polyoxadiazoles based on 5-t-butylisosphthalic acid. 4,500,701, Cl. 528-363.000.

Stern, Eric W.: *See—*
Amundsen, Alan R.; and Stern, Eric W., 4,500,465, Cl. 260-429.00R.

Stevens, Donn E., to Bausch & Lomb Incorporated. Motorized refraction apparatus. 4,500,180, Cl. 351-234.000.

Stewart, Richard C.: *See—*
Brown, Karen K.; and Stewart, Richard C., 4,500,513, Cl. 424-89.000.

Steyr-Daimler-Puch Aktiengesellschaft: *See—*
Visek, Tomas, 4,499,869, Cl. 123-195.00C.

Stifter, Francis J., to Electronic Specialists. Oscillator phase lock system. 4,500,853, Cl. 331-18.000.

Stockinger, Friedrich; and Haug, Theobald, to Ciba-Geigy Corporation. Phenol-novolaks containing amino groups. 4,500,691, Cl. 525-503.000.

Stoll, Andy J., III, to Owens-Illinois, Inc. Parrot-beakable freestanding plastic drum assemblage for handling heavy materials. 4,500,007, Cl. 220-71.000.

Stoll, Kurt. Three-way air valve. 4,499,921, Cl. 137-627.500.

Stollberg, Theodore A.: *See—*
Bergeron, Ned; and Stollberg, Theodore A., 4,499,846, Cl. 116-272.000.

Stoltman, Donald D.; and Nichols, Gary A., to General Motors Corporation. Fuel supply system for an internal combustion engine. 4,499,879, Cl. 123-480.000.

Stone, Emory B. Nut harvester. 4,499,713, Cl. 56-328.00R.

Stone Safety Corporation: *See—*
Prete, Ralph, 4,500,949, Cl. 363-28.000.

Stoner, Donald L.: *See—*
Darland, Michael L.; Stoner, Donald L.; Baker, James W., Jr.; and Sponhnholtz, Michael A., 4,500,751, Cl. 179-2.0DP.

Stopinc Aktiengesellschaft: *See—*
Zaugg, Robert; and Keller, Werner, 4,500,018, Cl. 222-598.000.

Stork, Willem H. J.: *See—*
van Dongen, Robert H.; and Stork, Willem H. J., 4,500,416, Cl. 208-86.000.

Strahorn, Francis W.: *See—*
Cochran, Stanley R.; and Strahorn, Francis W., 4,500,278, Cl. 425-445.000.

Strata Bit Corporation: *See—*
Radtke, Robert P., 4,499,795, Cl. 76-108.00A.
Radtke, Robert P.; and Morris, Wilford V., 4,499,958, Cl. 175-329.000.

Stratford, Graham: *See—*
Gesing, Adam J.; and Stratford, Graham, 4,500,643, Cl. 501-96.000.

Strong, William K., to Restaurant Technology, Inc. Method and apparatus for holding freshly prepared fried food products. 4,499,818, Cl. 99-483.000.

Studer, Philip A.: *See—*
Evans, Jack; and Studer, Philip A., 4,500,265, Cl. 417-417.000.

Sud, Rahul; and Hardee, Kim C., to Inmos Corporation. Bootstrap driver circuits for an MOS memory. 4,500,799, Cl. 307-449.000.

Suga, Akira: *See—*
Hashimoto, Seiji; Tanaka, Nobuyoshi; Suga, Akira; and Kuwayama, Tetsuro, 4,500,913, Cl. 358-44.000.

Suga, Masaaki: *See—*
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Futagi, Masaaki, 4,499,979, Cl. 192-3.310.

Sugawara, Hiroyuki: *See—*
Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,500,998, Cl. 372-61.000.

Sugi, Hidekuni: *See—*
Kanayama, Kenji; and Sugi, Hidekuni, 4,500,806, Cl. 310-198.000.

Sugihara, Masanori, to Pioneer Electronic Corporation. Device for automatically stopping a tape recorder. 4,500,049, Cl. 242-186.000.

Sugimoto, Norihiko; Hamada, Nobuhiro; Masuda, Ikuro; and Sakurai, Jinichi, to Hitachi, Ltd. Plant control system. 4,500,951, Cl. 364-186.000.

Sugimoto, Osamu; and Akagawa, Masaki, to Kabushiki Kaisha Nippon Coinco. Vend possible judgement device for a vending machine. 4,499,982, Cl. 194-1.00N.

Sugino, Kenji; and Nagata, Yukiaki, to Sugino Machine Limited. Variable pressure and displacement reciprocating pump. 4,500,262, Cl. 417-214.000.

Sugino Machine Limited: *See—*
Sugino, Kenji; and Nagata, Yukiaki, 4,500,262, Cl. 417-214.000.

Sugiura, Katsuhiko, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the ignition timing of an engine. 4,499,874, Cl. 123-407.000.

Sugiyama, Hiroyuki, to Victor Company of Japan, Ltd. Jitter compensation system in a rotary recording medium reproducing apparatus. 4,500,981, Cl. 369-43.000.

Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus. 4,500,983, Cl. 369-77.200.

Suh, John T.; Barton, Jeffrey N.; and Regan, John R., to USV Pharmaceutical Corporation. Therapeutic dipeptides. 4,500,713, Cl. 546-165.000.

Suh, John T.: *See—*
Loev, Bernard; Jones, Howard; and Suh, John T., 4,500,532, Cl. 514-256.000.

Suica, David E.: *See—*
Hennekes, Daniel M.; Suica, David E.; and Beckman, Robert F., 4,500,065, Cl. 248-542.000.

Sullivan, Ann C.: *See—*
Hamilton, James G.; Sullivan, Ann C.; Tobias, Lawrence D.; and Triscari, Joseph, 4,500,540, Cl. 514-397.000.

Sullivan, William N., to United States of America, Energy. Wind turbine spoiler. 4,500,257, Cl. 416-32.000.

Sumitomo Chemical Company Limited: *See—*
Yamachika, Hiroshi; and Nakanishi, Hirotoshi, 4,500,721, Cl. 549-362.000.

Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See—*
Satake, Jiro; Arai, Tetsuzo; Tanaka, Kivokazu; Mikami, Eiji; Moriyasu, Tsuneo; and Nakagawa, Tadasu, 4,500,577, Cl. 428-36.000.

Sumka, Elmer H.: *See—*
De Lorenzi, John J.; and Sumka, Elmer H., 4,499,973, Cl. 187-29.000.

Sunakawa, Makoto: *See—*
Hori, Yutaka; Sunakawa, Makoto; Takayama, Kikuo; Matsuoka, Naoki; and Moroishi, Yutaka, 4,500,683, Cl. 524-533.000.

Sundberg, Jack G.; Schaffner, John P.; and Conlon, Daniel J., to Chandler Evans Inc. Rotary pump having brake means with thermal fuse. 4,500,268, Cl. 418-1.000.

Sung, Rodney L.: *See—*
Kaufman, Benjamin J.; Liu, Christopher S.; and Sung, Rodney L., 4,500,440, Cl. 252-51.50A.

Sunouchi, Akio; Suzuki, Ryuji; Fujino, Masahisa; and Konno, Tatsuo, to Canon Kabushiki Kaisha. Shutter control device for camera. 4,500,186, Cl. 354-234.000.

Sunter, Thomas C., to Air Preheater Company, Inc., The. Method for sequentially cleaning filter elements in a multiple chamber fabric filter. 4,500,326, Cl. 55-21.000.

Susami, Larry: *See—*
Hauck, Robert B.; and Susami, Larry, 4,501,011, Cl. 378-196.000.

Suur-Askola, Seppo: *See—*
Makinen, Heimo; and Suur-Askola, Seppo, 4,499,972, Cl. 187-29.00R.

Suyderhoud, Henri G.: *See—*
Virupaksha, Krishnamoorthy; and Suyderhoud, Henri G., 4,500,842, Cl. 328-150.000.

Suzuki, Akira; Shioya, Yasumi; Watanabe, Norio; and Kimura, Keiichi, deceased (by Kimura, Kazuyoshi, Toshi Kimura, heirs), to Shinryo Air Conditioning Co., Ltd. Activated-sludge process for wastewater treatment. 4,500,427, Cl. 210-608.000.

Suzuki, Hidetoshi: *See—*
Koumura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, 4,500,918, Cl. 358-75.000.

Suzuki, Hiroaki; and Misono, Shinji, to Tokai Carbon Co., Ltd. Rubber composition comprising furnace carbon black. 4,500,672, Cl. 524-496.000.

Suzuki, Masaaki: *See—*
Ogawa, Hiroshi; Mizuno, Chiaki; Masaki, Kouichi; Suzuki, Masaaki; and Tamai, Yasuo, 4,500,599, Cl. 428-336.000.

Suzuki, Michio: *See—*
Sakura, Yasuhiro; Takai, Yoshihiro; and Suzuki, Michio, 4,500,893, Cl. 346-76.0PH.

Suzuki, Osamu: *See—*
Oishi, Kengo; and Suzuki, Osamu, 4,500,050, Cl. 242-198.000.

Suzuki, Ryoichi; and Tokuda, Ryuji, to Canon Kabushiki Kaisha. Indicating apparatus for camera. 4,500,193, Cl. 354-471.000.

Suzuki, Ryuji: *See—*
Sunouchi, Akio; Suzuki, Ryuji; Fujino, Masahisa; and Konno, Tatsuo, 4,500,186, Cl. 354-234.000.

Suzuki, Seikou: *See—*
Miki, Masayuki; Suzuki, Seikou; and Sasayama, Takao, 4,499,880, Cl. 123-489.000.

Suzuki, Soubei: *See—*
Nishizawa, Junichi; Suzuki, Soubei; and Tamamushi, Takashige, 4,499,654, Cl. 29-571.000.

Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Futagi, Masaaki, to Nissan Motor Company, Limited. Lock-up control system for lock-up torque converter for lock-up type automatic transmission. 4,499,979, Cl. 192-3.310.

Suzuki, Toshiro: *See—*
Takatori, Hiroshi; and Suzuki, Toshiro, 4,500,999, Cl. 375-16.000.

Suzuki, Tsutai: *See—*
Kashiwagi, Yoshiyuki; and Suzuki, Tsutai, 4,500,383, Cl. 156-285.000.

Suzuki, Yoji; Imaizumi, Atsushi; Yamaguchi, Hisao; Kanesaki, Masaharu; and Ono, Shoji, to Teijin Limited. Culturing Bordetella in media containing etherified cyclodextrin. 4,500,639, Cl. 435-244.000.

Suzuki, Yukio: *See—*
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Nogami, Susumu; and Suzuki, Yukio, 4,499,882, Cl. 123-492.000.

Svoboda, Josef, to TMC Corporation. Ski brake. 4,500,106, Cl. 280-605.000.

Svoboda, Josef; and Szabo, Emilie, to TMC Corporation. Ski brake. 4,500,107, Cl. 280-605.000.

Swanson, Richard G., to Esco Design, Inc. Electromechanical linear actuator. 4,500,805, Cl. 310-80.000.

Swaringen, Roy A.: *See—*
Wisowaty, James C.; Swaringen, Roy A.; and Yeowell, David A., 4,500,711, Cl. 544-258.000.

Swart, Daniel J.: *See—*
Kruper, William J., Jr.; and Swart, Daniel J., 4,500,704, Cl. 528-405.000.

Swartz, William E.: *See*—
Bender, Fredric G.; Everson, Charles W.; and Swartz, William E., 4,500,559, Cl. 426-646.000.
Swedlow, Inc.: *See*—
Ashlock, L. T.; Mukamal, Harold; and White, William H., 4,500,669, Cl. 524-440.000.
Swenson, Paul M.: *See*—
Devellian, Richard D.; and Swenson, Paul M., 4,500,279, Cl. 425-548.000.
Swift, Allan W., to E. J. Brooks Company. Seal of the padlock type. 4,500,124, Cl. 292-318.000.
Swindler, Danny E., to Texas Instruments Incorporated. Electronic printer mechanism with movable printhead assembly. 4,500,217, Cl. 400-320.000.
Swingley, Harold E., Jr., to Menasha Corporation. Tote box. 4,499,997, Cl. 206-509.000.
Syme, Duncan C., to Vermont Castings, Inc. Method and apparatus for improved construction of fuel burning heating assemblies. 4,499,889, Cl. 126-75.000.
Szabo, Emilie: *See*—
Svoboda, Josef; and Szabo, Emilie, 4,500,107, Cl. 280-605.000.
Szczupak, David T.; Walsham, Brian E.; Hooley, Desmond J.; Flaxington, David; McKean, Peter S.; and Wescott, John D., to Holset Engineering Company Limited. Turbocharger having a variable inlet area turbine. 4,499,732, Cl. 60-602.000.
Szoke, Abraham; and Prosnitz, Donald, to United States of America, Energy. Multifrequency, single pass free electron laser. 4,500,843, Cl. 330-4.300.
Tag, Arne; Petterson, Bjorn R.; and Nygaard, Erik C., to Norsk Hydro a.s. Emulsion explosive. 4,500,369, Cl. 149-2.000.
Tagashira, Yoshimi: *See*—
Yoshida, Yasuharu; Seguchi, Hiroshi; and Tagashira, Yoshimi, 4,501,004, Cl. 375-102.000.
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Signal sampling gate circuit. 4,500,931, Cl. 358-310.000.
Tahata, Michio: *See*—
Zaita, Katsuyuki; and Tahata, Michio, 4,500,477, Cl. 261-44.00B.
Tahka Oy: *See*—
Lehtola, Erkki T., 4,499,989, Cl. 198-407.000.
Taira, Kazuo; Morofuji, Akihiko; Ueno, Hiroshi; and Kobayashi, Seishichi, to Toyo Seikan Kaisha, Ltd. Hot-melt adhesive of a copolyester of a dibasic acid with a polyhydric alcohol. 4,500,575, Cl. 428-35.000.
Taiyo Ltd.: *See*—
Izume, Masayuki, 4,500,082, Cl. 270-20.100.
Taiyo Yuden Kabushiki Kaisha: *See*—
Hayashi, Yutaka; Yamanaka, Mithuyuki; Iida, Hideyo; Shiba, Nobuyasu; Karasawa, Hideyuki; Mishuku, Toshio; and Itou, Atsuo, 4,500,743, Cl. 136-258.000.
Tajima, Akira: *See*—
Kitagishi, Nozomu; and Tajima, Akira, 4,500,188, Cl. 354-406.000.
Tajima, Shigeru; Okada, Hiroshi; and Nakano, Kenji, to Sony Corporation. Digital capstan servo circuit. 4,500,822, Cl. 318-314.000.
Takagaki, Yoshio: *See*—
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.
Takagi, Toshinori: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,500,741, Cl. 136-206.000.
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,500,742, Cl. 136-206.000.
Takahara, Yoshimasa: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Inai, Yuichi; Kohara, Yoshiyuki; Kawakami, Yoshiyuki; and Tsurugi, Tomio, 4,500,463, Cl. 260-406.000.
Takahashi, Hideaki; Hayakawa, Kiyoharu; Kondo, Haruyoshi; and Takeuchi, Takashi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Oxygen sensor with heater. 4,500,412, Cl. 204-425.000.
Takahashi, Hidenori: *See*—
Hosokawa, Tomoyoshi; Matsuura, Ikutoshi; Takahashi, Hidenori; Ando, Kunio; and Tamura, Gakuzo, 4,500,544, Cl. 514-543.000.
Takahashi, Katsutoshi: *See*—
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, 4,500,452, Cl. 260-112.50R.
Takahashi, Osamu; Yamamura, Nobuo; Mukunoki, Yasuo; Ogawa, Shungi; and Nakagawa, Yutaka, to Fuji Photo Film Co., Ltd. Process for preparing aqueous dispersion of pigment. 4,500,362, Cl. 106-309.000.
Takahashi, Susumu, to Olympus Optical Co., Ltd. Illuminating optical system for endoscopes. 4,500,181, Cl. 350-574.000.
Takahashi, Tokuyuki: *See*—
Kuramochi, Koujiro; and Takahashi, Tokuyuki, 4,499,789, Cl. 74-740.000.
Takahashi, Toshiyuki: *See*—
Kubota, Hitoshi; Hamamatsu, Seiji; Yambe, Teluo; and Takahashi, Toshiyuki, 4,500,761, Cl. 200-84.00C.
Takahashi, Yonosuke: *See*—
Wada, Minoru; Takahashi, Yonosuke; and Hasegawa, Eiichi, 4,500,889, Cl. 346-1.100.
Takai, Yoshihiro: *See*—
Sakura, Yasuhiro; Takai, Yoshihiro; and Suzuki, Michio, 4,500,893, Cl. 346-76.0PH.
Takao, Mitsunori, to Nippondenso Co., Ltd. Method and apparatus for controlling internal combustion engines. 4,499,881, Cl. 123-492.000.
Takao, Shoichi: *See*—
Nakaoji, Kazuhiko; Kamao, Mitsugu; Itoh, Hayami; Tatsumi, Shuhei; and Takao, Shoichi, 4,500,041, Cl. 241-16.000.
Takasago Perfumery Co., Ltd.: *See*—
Minagawa, Motoi, 4,499,620, Cl. 8-158.000.
Takatori, Hiroshi; and Suzuki, Toshiro, to Hitachi, Ltd. Line equalizer. 4,500,999, Cl. 375-16.000.
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, to Fujisawa Pharmaceutical Co., Ltd. Thiinyl and oxothiolyl derivatives. 4,500,709, Cl. 544-58.100.
Takayama, Kikuo: *See*—
Hori, Yutaka; Sunakawa, Makoto; Takayama, Kikuo; Matsuoka, Naoki; and Moroishi, Yutaka, 4,500,683, Cl. 524-533.000.
Takayama, Syuichi, to Olympus Optical Co., Ltd. Endoscope system with an electric bending mechanism. 4,499,895, Cl. 128-6.000.
Takeda Chemical Industries, Ltd.: *See*—
Nishino, Hiroshi; Aibe, Toshio; and Noguchi, Katsuya, 4,500,327, Cl. 55-72.000.
Takeda, Mutsumi, to Hitachi Koki Haramachi Works, Ltd. Safety device for a meat slicer. 4,499,804, Cl. 83-399.000.
Takehara, Hidetoshi; Shioji, Shorbu; and Nakagawa, Yohichi, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Water soluble copolymer method for manufacture therefore and use thereof. 4,500,693, Cl. 526-240.000.
Takemasa, Kaoru, to Pioneer Electronic Corporation. Tape recording machine. 4,499,783, Cl. 74-411.000.
Takemura, Makoto: *See*—
Wakayama, Masao; Takemura, Makoto; and Kasagi, Takao, 4,500,360, Cl. 106-286.500.
Takeuchi, Hideo; Kaneko, Toshihisa; and Ikeda, Satoshi, to Dai Nippon Insatsu Kabushiki Kaisha. System for automatically removing dust from plate cylinders of printing press. 4,499,827, Cl. 101-425.000.
Takeuchi, Takashi: *See*—
Takahashi, Hideaki; Hayakawa, Kiyoharu; Kondo, Haruyoshi; and Takeuchi, Takashi, 4,500,412, Cl. 204-425.000.
Takeuchi, Tetsuo, to Sony Corporation. Injection molding method for making a switch. 4,499,662, Cl. 29-622.000.
Takezoe, Fumihiko; and Fujii, Junichi, to Fuji Facom Corporation; and Fuji Electric Company Limited. Data transfer abnormality processing system. 4,500,953, Cl. 364-200.000.
Takigami, Katsuhiko; and Tokushuku, Keiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Pressure-applied type semiconductor device. 4,500,907, Cl. 357-79.000.
Takigawa, Nobuhiro: *See*—
Kubo, Keishi; Watanabe, Hideo; Takigawa, Nobuhiro; Hagiri, Minoru; and Kawasaki, Kanjiro, 4,500,896, Cl. 346-204.000.
Takimoto, Masatami: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,500,476, Cl. 261-44.00C.
Takishima, Shoko: *See*—
Honda, Masamitsu; Nagai, Hideaki; Takishima, Shoko; Kawamura, Akinori; Kawamura, Noriko; Dan, Takashi; Koizumi, Masuo; Murakami, Yasushi; Hinohara, Yoshikazu; Nakano, Hideki; and Takagaki, Yoshio, 4,500,714, Cl. 546-309.000.
Takita, Naka: *See*—
Kitagawa, Katsutoshi; Isogai, Kiyoshi; Ohmori, Nobuo; Takita, Naka; Okamoto, Makoto; Koga, Itsuo; and Ito, Kazuo, 4,500,099, Cl. 277-228.000.
Talibdzhanov, Zakhidzhan S.: *See*—
Eschenko, Vladislav Y.; Musaev, Irsali K.; Talibdzhanov, Zakhidzhan S.; Leonov, Viktor A.; Bobrov, Anatoly D.; Kirovsky, Efim I.; Gritsenko, Vladimir A.; and Golovanov, Alexandr V., 4,500,282, Cl. 431-184.000.
Tamai, Yasuo: *See*—
Ogawa, Hiroshi; Mizuno, Chiaki; Masaki, Kouichi; Suzuki, Masaaki; and Tamai, Yasuo, 4,500,599, Cl. 428-336.000.
Tamamushi, Takashige: *See*—
Nishizawa, Junichi; Suzuki, Soubei; and Tamamushi, Takashige, 4,499,654, Cl. 29-571.000.
Tamboers, Gerhard: *See*—
Cyriax, Wilhelm; Tamboers, Gerhard; and Holzschuh, Johannes, 4,500,274, Cl. 425-185.000.
Tamfelt Oy AB: *See*—
Lundstrom, Kristian, 4,500,588, Cl. 428-212.000.
Tamura, Gakuzo: *See*—
Hosokawa, Tomoyoshi; Matsuura, Ikutoshi; Takahashi, Hidenori; Ando, Kunio; and Tamura, Gakuzo, 4,500,544, Cl. 514-543.000.
Tamura, Jun: *See*—
Kaneko, Kazuyoshi; and Tamura, Jun, 4,500,134, Cl. 297-170.000.
Tamura, Masuhiko: *See*—
Kitamura, Takanori; Matsumoto, Mitsuo; and Tamura, Masuhiko, 4,500,727, Cl. 560-179.000.
Tanabe, Osami: *See*—
Aoki, Kozo; Ogawa, Akira; and Tanabe, Osami, 4,500,635, Cl. 430-552.000.
Tanabe, Toshiyuki, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for angularly positioning a rotary member. 4,499,792, Cl. 74-825.000.
Tanaka, Izumi: *See*—
Shirai, Kazunari; and Tanaka, Izumi, 4,500,899, Cl. 357-23.000.
Tanaka, Kazuo: *See*—
Tanaka, Toru; Hataya, Masanori; Tanaka, Kazuo; Sakai, Yukio; and Hamada, Yasufumi, 4,500,730, Cl. 562-416.000.

Tanaka, Kenji; and Endo, Shigeru, to Nisshin Flour Milling Co., Ltd. Agents for improving bread in quality and bread containing same. 4,500,551, Cl. 426-62.000.
Tanaka, Kivokazu: *See—*
Satake, Jiro; Arai, Tetsuzo; Tanaka, Kivokazu; Mikami, Eiji; Moriyasu, Tsuneo; and Nakagawa, Tadasu, 4,500,577, Cl. 428-36.000.
Tanaka, Kyoichi; Tsuzuki, Akira; and Hioki, Shunichi, to Toyo Contact Lens Co., Ltd. Contact lens cleaning and storage composition. 4,500,441, Cl. 252-89.100.
Tanaka, Minoru: *See—*
Haneda, Satoshi; Itaya, Masahiko; and Tanaka, Minoru, 4,500,616, Cl. 430-45.000.
Tanaka, Motoaki; Toyama, Takanori; Ohba, Hitoshi; and Yamaguchi, Osamu, to Wako Pure Chemical Industries, Ltd. Process for producing aqueous suspension containing organic azo compound as polymerization initiator. 4,500,649, Cl. 502-167.000.
Tanaka, Nobuyoshi: *See—*
Hashimoto, Seiji; Tanaka, Nobuyoshi; Suga, Akira; and Kuwayama, Tetsuro, 4,500,913, Cl. 358-44.000.
Tanaka, Taro: *See—*
Igashira, Toshihiko; Tanaka, Taro; and Sakakibara, Yasuyuki, 4,499,878, Cl. 123-478.000.
Tanaka, Toru; Hataya, Masanori; Tanaka, Kazuo; Sakai, Yukio; and Hamada, Yasufumi, to Mitsubishi Gas Chemical Company, Inc. Process for producing aromatic polycarboxylic acid. 4,500,730, Cl. 562-416.000.
Tanaka, Toshie, to Nifco Inc. Removable two-piece retaining means. 4,499,636, Cl. 24-289.000.
Tanaka, Toshinori: *See—*
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; and Tanaka, Toshinori, 4,500,794, Cl. 290-38.00C.
Tanaka, Yoko: *See—*
DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, 4,500,460, Cl. 260-397.200.
Tanaka, Yoshito; Ichiryu, Ken; and Iwata, Naohiko, to Hitachi, Ltd. Fluid leakage detecting element. 4,500,865, Cl. 338-13.000.
Tandy Corporation: *See—*
Leininger, Steven, 4,500,956, Cl. 364-200.000.
Tang, David Y.: *See—*
Cotter, Byron R.; and Tang, David Y., 4,500,471, Cl. 260-544.00D.
Tanguy, Christian, to Societe Anonyme D.B.A. Rotary distributor for a hydraulic servo-mechanism. 4,499,922, Cl. 137-625.240.
Tani, Haruhisa: *See—*
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Tsuyama, Setsuya; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,499,639, Cl. 28-282.000.
Taniguchi, Masahiko: *See—*
Tomioka, Susumu; and Taniguchi, Masahiko, 4,500,384, Cl. 156-290.000.
Tanikawa, Kowji, to Olympus Optical Co., Ltd. Film cassette and a photographing device using the same. 4,500,183, Cl. 354-21.000.
Tappan Company, The: *See—*
Harris, Stephen K.; and Miller, Wiley W., 4,499,630, Cl. 16-121.000.
Tarao, Ryokichi: *See—*
Yemoto, Jiichiro; Tarao, Ryokichi; and Yamamoto, Yoshio, 4,500,725, Cl. 556-482.000.
Tatsumi, Shuhei: *See—*
Nakaoji, Kazuhiko; Kamao, Mitsugu; Itoh, Hayami; Tatsumi, Shuhei; and Takao, Shoichi, 4,500,041, Cl. 241-16.000.
Taya, Akira; Narita, Kazuo; Asada, Masao; and Kimura, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Blue-green emitting halophosphate phosphor. 4,500,443, Cl. 252-301.40P.
Taylor, Dale F.; and Sammler, Louis S., to General Electric Company. Sintered ceramic article with porous region. 4,500,413, Cl. 204-435.000.
Taylor, Gary N., to AT&T Bell Laboratories. Process of making solid state devices using silicon containing organometallic plasma developed resists. 4,500,628, Cl. 430-311.000.
Technion Research & Development Foundation Ltd.: *See—*
Tur-Kaspa, Yosef; and Lenz, Ehud, 4,500,126, Cl. 294-86.00R.
Yarnitzky, Chaim N., 4,500,411, Cl. 204-413.000.
Technische Hogeschool Delft: *See—*
Schijve, Jacobus; Vogelesang, Laurens B.; and Marissen, Roelof, 4,500,589, Cl. 428-213.000.
Technitrol, Inc.: *See—*
McInerny, George P., 4,500,084, Cl. 271-35.000.
Teijin Limited: *See—*
Suzuki, Yoji; Imaizumi, Atsushi; Yamaguchi, Hisao; Kanesaki, Masaharu; and Ono, Shoji, 4,500,639, Cl. 435-244.000.
Tektronix, Inc.: *See—*
Odenthal, Conrad J.; and Askew, Dennis D., 4,500,809, Cl. 313-444.000.
Teleflex Incorporated: *See—*
Bennett, William G.; and Spease, Arthur L., 4,499,785, Cl. 74-501.00R.
Telefunken Electronic GmbH: *See—*
Kohn, Erhard, 4,499,651, Cl. 29-571.000.
Telle, Otto: *See—*
Hausmann, Heinz; Niessen, Heinz J.; Telle, Otto; and Neumaier, Hermann, 4,500,348, Cl. 71-103.000.
Temperilli, Aldemio: *See—*
Bernardi, Luigi; Temperilli, Aldemio; Ruggieri, Daniela; Arcari, Giuliana; and Salvati, Patricia, 4,500,712, Cl. 546-67.000.
Templeton Kenly & Company: *See—*
Leong, David S., 4,500,072, Cl. 254-95.000.
Tempmaster Corporation: *See—*
Reese, James A.; and Dean, Raymond H., 4,500,034, Cl. 236-49.000.
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, to Toyota Jidosha Kabushiki Kaisha; and Aisan Industry Co., Ltd. Variable venturi type carburetor. 4,500,476, Cl. 261-44.00C.
Teraue, Takeshi: *See—*
Misaka, Yoshiharu; Teraue, Takeshi; and Hatae, Masamiti, 4,500,652, Cl. 521-33.000.
Terry, F. Duncan: *See—*
Buck, Roy T.; Cloutier, Frank L.; Erni, R. Ernst; Low, Robert N.; and Terry, F. Duncan, 4,500,895, Cl. 346-140.00R.
Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,500,720, Cl. 549-313.000.
Texaco Inc.: *See—*
Bordages, John W., 4,499,799, Cl. 81-446.000.
Brennan, Michael E., 4,500,655, Cl. 521-163.000.
Kaufman, Benjamin J.; Liu, Christopher S.; and Sung, Rodney L., 4,500,440, Cl. 252-51.50A.
Vuong, Dinh-Cuong, 4,500,324, Cl. 48-197.00R.
Texas A&M University: *See—*
Fenn, Lloyd B., 4,500,335, Cl. 71-28.000.
Texas Instruments Incorporated: *See—*
Cottle, Wilbur W., Jr.; and Smith, Lilburn R., 4,500,051, Cl. 244-3.160.
Ehni, George J., 4,500,845, Cl. 330-86.000.
Penz, Perry A.; and Sampsell, Jeffrey B., 4,500,171, Cl. 350-320.000.
Swindler, Danny E., 4,500,217, Cl. 400-320.000.
Textron, Inc.: *See—*
Dulin, Kerry, 4,500,936, Cl. 361-152.000.
Dulin, Kerry, 4,500,938, Cl. 361-153.000.
Thanner, Otto: *See—*
Huber, Johann; and Thanner, Otto, 4,500,325, Cl. 51-298.000.
Theobald, Hans: *See—*
Becker, Rainer; Theobald, Hans; Schirmer, Ulrich; Spiegler, Wolfgang; Seufert, Walter; and Wuerzer, Bruno, 4,500,340, Cl. 71-90.000.
Therond, Marcel P. Hydraulic press mechanism. 4,499,728, Cl. 60-570.000.
Thiokol Corporation: *See—*
Grey, James T., Jr., 4,500,114, Cl. 280-742.000.
Thoese, Klaus, to Hoechst Aktiengesellschaft. Drafting film. 4,500,598, Cl. 428-331.000.
Thoma, Nandor G.: *See—*
Cases, Moises; Kraft, Wayne R.; Stahl, William L., Jr.; and Thoma, Nandor G., 4,500,800, Cl. 307-468.000.
Thomas, Charles H., to Westinghouse Electric Corp. Low cost polyester modified phenolic resin containing a combination of long and short chain alkylphenols. 4,500,689, Cl. 525-442.000.
Thompson, David A., to Corning Glass Works. Volatile metal complexes. 4,500,722, Cl. 549-429.000.
Thompson, Matthew V.: *See—*
Ren, Chung-Li; Thompson, Matthew V.; and Wang, Han-Chiu, 4,500,859, Cl. 333-208.000.
Thompson, Monty R. Manual work-feeding device and guard body for shaping machines. 4,499,933, Cl. 144-134.00A.
Thomson-CSF: *See—*
Broussoux, Dominique; Facoetti, Hugues; Ravinet, Pierre; Bernard, Daniel; and Micheron, Francois, 4,500,377, Cl. 156-164.000.
Demuth, Dietmar, 4,499,902, Cl. 128-660.000.
Gimel, Bernard; and DeFay, Christian, 4,500,891, Cl. 346-76.0PH.
Hareng, Michel; and Moutou, Paul, 4,500,878, Cl. 340-713.000.
Malbec, Yves; Boisot, Yves; Bontemps, Daniel; and Duhamel, Georges, 4,500,760, Cl. 200-83.00C.
Rascle, Roger; and Lange, Francois, 4,500,486, Cl. 264-335.000.
Ratigalas, Max, 4,500,871, Cl. 340-347.0DD.
Thorsness, Charles B.: *See—*
Hill, Richard W.; Skinner, Dewey F.; and Thorsness, Charles B., 4,499,945, Cl. 166-50.000.
Thorsrud, Lee T.: *See—*
Bennett, Donald B.; Thorsrud, Lee T.; and Petschauer, Thomas W., 4,500,988, Cl. 370-85.000.
Thorton, Donald I.; and Peyton, Richard H., to Allied Corporation. Pump valve for liquid separator. 4,500,425, Cl. 210-136.000.
Tillman, Willie, to Phillips Petroleum Company. Changing oil tubes in a carbon black reactor. 4,500,491, Cl. 422-150.000.
Tillyard, Malcolm: *See—*
Hanson, Raymond; and Tillyard, Malcolm, 4,500,773, Cl. 219-215.000.
Timex Corporation: *See—*
Leibowitz, Marshall; and George, Douglas A., 4,500,173, Cl. 350-345.000.
Timpte Industries, Inc.: *See—*
Harms, Orville L., 4,500,123, Cl. 292-259.00A.
Tincher, Jon D., to General Motors Corporation. Rotary weld gun support with electrical coupling. 4,500,769, Cl. 219-86.330.
Titus, Robert D.: *See—*
Bach, Nicholas J.; Kornfeld, Edmund C.; and Titus, Robert D., 4,500,545, Cl. 514-619.000.
Tkac, Alexander; and Cvengros, Jan, to Slovenska vysoka skola technika. Elastic scraper for high-capacity film device. 4,500,390, Cl. 159-6.100.
TMC Corporation: *See—*
Svoboda, Josef, 4,500,106, Cl. 280-605.000.
Svoboda, Josef; and Szabo, Emilie, 4,500,107, Cl. 280-605.000.

Tobias, Lawrence D.: *See—*
Hamilton, James G.; Sullivan, Ann C.; Tobias, Lawrence D.; and Triscari, Joseph, 4,500,540, Cl. 514-397.000.

Todaka, Yoshihiro: *See—*
Hanma, Kentaro; Murakami, Toshio; and Todaka, Yoshihiro, 4,500,925, Cl. 358-227.000.

Toho Belson Co., Ltd.: *See—*
Minamisawa, Tsuyoshi; Kogo, Yasuo; and Nagata, Yasuhisa, 4,500,660, Cl. 523-428.000.

Toho-Polymer Kabushika Kaisha: *See—*
Nishikawa, Yoshikawzu, 4,500,218, Cl. 400-490.000.

Tokai Carbon Co., Ltd.: *See—*
Suzuki, Hiroaki; and Misono, Shinji, 4,500,672, Cl. 524-496.000.
Yamamoto, Akira, 4,500,504, Cl. 423-345.000.

Tokai TRW & Co. Ltd.: *See—*
Abe, Michio; and Maeda, Naoyuki, 4,499,964, Cl. 180-142.000.

Tokico Ltd.: *See—*
Kubota, Hitoshi; Hamamatsu, Seiji; Yambe, Teluo; and Takahashi, Toshiyuki, 4,500,761, Cl. 200-84.00C.

Tokitsu, Naoki; Fujiwara, Toshitaka; Kato, Toranosuke; and Uno, Toshihiko, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Automotive driving instruction system. 4,500,868, Cl. 340-52.00F.

Tokuda, Ryuji: *See—*
Suzuki, Ryoichi; and Tokuda, Ryuji, 4,500,193, Cl. 354-471.000.

Tokunaga, Toshihide: *See—*
Kajioka, Hiroichi; Tokunaga, Toshihide; and Nakagawa, Junkichi, 4,500,168, Cl. 350-96.340.

Tokushuku, Keiko: *See—*
Takigami, Katsuhiko; and Tokushuku, Keiko, 4,500,907, Cl. 357-79.000.

Tokyo Electric Co., Ltd.: *See—*
Sakura, Yasuhiro; Takai, Yoshihiro; and Suzuki, Michio, 4,500,893, Cl. 346-76.0PH.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Futaki, Kenji; and Dekura, Hitoshi, 4,500,971, Cl. 364-513.500.
Iwai, Hiroshi, 4,500,615, Cl. 430-30.000.
Komakine, Takashi, 4,499,944, Cl. 165-104.160.
Motoyama, Takeshi; Onishi, Toshiyuki; and Yokoyama, Kunio, 4,499,738, Cl. 62-155.000.
Nozaki, Hidetoshi; Kamimura, Takaaki; Hatayama, Tamothu; and Utagawa, Tadashi, 4,500,744, Cl. 136-258.000.
Ohmura, Yamichi; and Matsushita, Yoshiaki, 4,500,388, Cl. 156-603.000.
Sawa, Buntaro; and Honda, Naoto, 4,500,851, Cl. 331-2.000.
Shibata, Tadashi, 4,500,905, Cl. 357-68.000.
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,500,931, Cl. 358-310.000.
Takigami, Katsuhiko; and Tokushuku, Keiko, 4,500,907, Cl. 357-79.000.
Taya, Akira; Narita, Kazuo; Asada, Masao; and Kimura, Yoshio, 4,500,443, Cl. 252-301.40P.
Yoshimaru, Tomohisa, 4,500,926, Cl. 358-256.000.

Tokyo Shibuara Denki Kabushiki Kaisha: *See—*
Miyano, Toshiyuki; and Ohmura, Hideo, 4,499,709, Cl. 53-589.000.

Tomihashi, Nobuyuki: *See—*
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,500,694, Cl. 526-245.000.

Tomioka, Susumu; and Taniguchi, Masahiko, to Chisso Corporation. Process for producing a non-woven fabric of hot-melt-adhered composite fibers. 4,500,384, Cl. 156-290.000.

Tomita, Satoru; Shimura, Akira; and Yokota, Takashi, to Ricoh Company, Ltd. Apparatus for cleaning a recording medium. 4,499,849, Cl. 118-652.000.

Tomizawa, Akimori; and Osaka, Hiroshi, to Clarion Co., Ltd. AGC Arrangement for a television system. 4,500,921, Cl. 358-174.000.

Toombs, Chauncey E. Lubricating oil salvaging block assembly. 4,499,969, Cl. 184-106.000.

Toray Industries, Incorporated: *See—*
Kamaishi, Tadami; and Kitagawa, Takao, 4,500,587, Cl. 428-204.000.

Toray Silicone Company, Inc.: *See—*
Kobayashi, Hideki; and Hamada, Mitsuo, 4,500,447, Cl. 252-511.000.

Torigoe, Masaaki: *See—*
Ohmura, Kunioki; Torigoe, Masaaki; Itoh, Isamu; and Hayashi, Katsumi, 4,500,632, Cl. 430-428.000.

Tornblom, Lars: *See—*
Ode, Bengt; and Tornblom, Lars, 4,500,261, Cl. 417-203.000.

Tosaka, Yoichi: *See—*
Haraguchi, Shosuke; and Tosaka, Yoichi, 4,500,185, Cl. 354-209.000.

Toshiba Battery Co., Ltd.: *See—*
Nagamine, Akio; Hayashi, Akira; Yoshida, Kazumasa; and Miyasaka, Kojiro, 4,500,614, Cl. 429-206.000.

Toshiba Ceramics Co., Ltd.: *See—*
Reiji, Oguma; and Akihiro, Hirai, 4,500,642, Cl. 501-54.000.

Toti, Andrew J. Patterned metal blind slat and method and apparatus for producing the same. 4,499,938, Cl. 160-236.000.

Townsend, Herbert E.: *See—*
Hart, Robert G.; and Townsend, Herbert E., 4,500,399, Cl. 204-181.00C.

Toyama, Takanori: *See—*
Tanaka, Motoaki; Toyama, Takanori; Ohba, Hitoshi; and Yamaguchi, Osamu, 4,500,649, Cl. 502-167.000.

Toyo Boseki Kabushiki Kaisha: *See—*
Kobayashi, Takuma; Kitagawa, Hironobu; and Kobayashi, Shigeo, 4,500,686, Cl. 525-408.000.

Toyo Contact Lens Co., Ltd.: *See—*
Tanaka, Kyoichi; Tsuzuki, Akira; and Hioki, Shunichi, 4,500,441, Cl. 252-89.100.

Toyo Seikan Kaisha, Ltd.: *See—*
Maruhashi, Yoshitsugu; Kano, Fumio; Yamada, Muneki; and Hirata, Sadao, 4,500,677, Cl. 525-57.000.
Taira, Kazuo; Morofuji, Akihiko; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,500,575, Cl. 428-35.000.

Toyo Soda Manufacturing Co. Ltd.: *See—*
Miyanaga, Akiyoshi; and Kurihara, Yukitada, 4,500,431, Cl. 210-656.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Kanda, Mutsumi; Nakanishi, Kiyoshi; Inoue, Tokuta; and Nakajima, Mikio, 4,499,868, Cl. 123-188.00M.
Kitagawa, Katsutoshi; Isogai, Kiyoshi; Ohmori, Nobuo; Takita, Naka; Okamoto, Makoto; Koga, Itsuo; and Ito, Kazuo, 4,500,099, Cl. 277-228.000.
Kuramochi, Koujiro; and Takahashi, Tokuyuki, 4,499,789, Cl. 74-740.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Nogami, Susumu; and Suzuki, Yukio, 4,499,882, Cl. 123-492.000.
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,500,476, Cl. 261-44.00C.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Tokitsu, Naoki; Fujiwara, Toshitaka; Kato, Toranosuke; and Uno, Toshihiko, 4,500,868, Cl. 340-52.00F.

Tran, Roger T.: *See—*
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.

Trans-World Manufacturing Corporation: *See—*
Lasky, Richard J., 4,500,088, Cl. 272-8.00M.

Transilwrap Company, Inc.: *See—*
Foster, William J., 4,500,382. Cl. 156-272.800.

Transtech Industrial Corporation: *See—*
Jow, Long S.; and Jow, Long J., 4,499,793, Cl. 74-866.000.

Trask, Barbara J.: *See—*
van den Engh, Gerrit J.; Trask, Barbara J.; and Visser, Johannes W. M., 4,500,641, Cl. 435-291.000.

Trassl, Werner, to Kraftwerk Union Aktiengesellschaft. Electrohydraulic control actuator for turbine valves. 4,500,066, Cl. 251-26.000.

Traut, Martin: *See—*
Kubinyi, Hugo; Traut, Martin; and Gries, Josef, 4,500,467, Cl. 514-2.000.

Tripier, Dominique: *See—*
Seipke, Gerhard; Tripier, Dominique; and Johnscher, Gerd, 4,500,450, Cl. 260-112.00R.

Triscari, Joseph: *See—*
Hamilton, James G.; Sullivan, Ann C.; Tobias, Lawrence D.; and Triscari, Joseph, 4,500,540, Cl. 514-397.000.

Trotter, Donald J., to Santrade Ltd. Flux retainer. 4,500,765, Cl. 219-73.210.

Trusock, George J.; Bauer, James J.; and Gandhi, Bhupen, to Clark Equipment Company. Auxiliary electric power supply for electric work vehicles. 4,500,819, Cl. 318-106.000.

Trutzschler GmbH & Co. KG: *See—*
Trutzschler, Hermann, 4,499,633, Cl. 19-105.000.

Trutzschler, Hermann, to Trutzschler GmbH & Co. KG. Apparatus for separating fiber tufts from an airstream. 4,499,633, Cl. 19-105.000.

Tsuboi, Hikotada: *See—*
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,500,719, Cl. 548-522.000.

Tsuboi, Nobuyoshi; Shima, Seiya; Kanasaki, Morio; and Nakazawa, Hayashi, to Hitachi, Ltd. Control apparatus for passenger conveyor. 4,499,986, Cl. 198-322.000.

Tsuchiya, Masatoshi; Soeno, Ko; and Yoshida, Tomomasa, to Hitachi, Ltd. Semiconductor pressure transducer. 4,499,774, Cl. 73-727.000.

Tsuchiya, Tatsuo; and Hozumi, Kazuhiro, to Matsushita Electric Industrial Co., Ltd.; and Kuroda Precision Industries Ltd. Air pressure shock absorber. 4,500,075, Cl. 267-8.00R.

Tsuda, Hiroshi: *See—*
Hashimoto, Shintaro; Masuzawa, Sigeaki; Shibata, Shinya; Tsuda, Hiroshi; and Nakano, Masahiro, 4,500,211, Cl. 368-63.000.

Tsuji, Kiyoshi: *See—*
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, 4,500,709, Cl. 544-58.100.

Tsuji, Shintaro, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for elevators. 4,499,975, Cl. 187-29.00R.

Tsukada, Toshihisa: *See—*
Koike, Norio; Tsukada, Toshihisa; Baji, Toru; and Sasano, Akira, 4,500,915, Cl. 358-44.000.

Tsurugi, Tomio: *See—*
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Inai, Yuichi; Kohara, Yoshiyuki; Kawakami, Yoshiyuki; and Tsurugi, Tomio, 4,500,463, Cl. 260-406.000.

Tsuruta, Keiji; and Tsutsumi, Nagayuki, to Mitsubishi Denki Kabushiki Kaisha. Package substation in tank with separate chambers. 4,500,935, Cl. 361-333.000.

Tsutsumi, Nagayuki: *See*—
Tsuruta, Keiji; and Tsutsumi, Nagayuki, 4,500,935, Cl. 361-333.000.
Tsuyama, Setsuya: *See*—
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Tsuyama, Setsuya; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,499,639, Cl. 28-282.000.
Tsuzuki, Akira: *See*—
Tanaka, Kyoichi; Tsuzuki, Akira; and Hioki, Shunichi, 4,500,441, Cl. 252-89.100.
Tucek, Frank J., to J. I. Case Company. Crawler track support system with vertically extensible centra rollers. 4,500,139, Cl. 305-10.000.
Tuchman, Walter L.: *See*—
Elander, Robert C.; Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Shuck, Robert E.; and Tuchman, Walter L., 4,500,750, Cl. 178-22.080.
Tucker, Daniel. Chlorine generator device. 4,500,404, Cl. 204-266.000.
Tucker, Harold A., to B. F. Goodrich Company, The. Hydrophosphonylated derivatives of glycidyl ether polymers. 4,500,684, Cl. 525-327.300.
Tuckey, Charles H., to Walbro Corporation. Gear rotor fuel pump. 4,500,270, Cl. 418-133.000.
Tundra Holdings Ltd.: *See*—
Milne, William G.; and Saruwatari, Minoru, 4,499,966, Cl. 182-3.000.
Tur-Kaspa, Yosef; and Lenz, Ehud, to Technion Research & Development Foundation Ltd. Object-gripping device and industrial robot including same. 4,500,126, Cl. 294-86.00R.
Turbak, Albin F.; Snyder, Fred W.; and Sandberg, Karen R., to International Telephone and Telegraph Corporation. Suspensions containing microfibriilated cellulose. 4,500,546, Cl. 514-781.000.
Turner, Larry S., to Owens-Corning Fiberglas Corporation. Five-tab strip shingles. 4,499,702, Cl. 52-555.000.
Turner, Robert L., to RCA Corporation. Video disc package. 4,499,995, Cl. 206-312.000.
Tuten, William J.; and Crosby, Kennith D., to Creative Technology Corp. Selective scrap metal collection apparatus. 4,499,984, Cl. 194-4.00C.
Tuttle, Alan H.; Leonard, James K.; and Dlugosz, Henry J., to McGraw-Edison Company. Turbine shaft seal assembly. 4,500,096, Cl. 277-53.000.
Tvedt, Kare E.; Kopstad, Guennar; and Haugen, Olav A., to C. Reichert Optische Werke, AG. Device for handling thin sections, in particular cryosections, and process for freeze-drying thin sections. 4,499,670, Cl. 34-143.000.
Tyrolit Schleifmittelworke Swarovski K.G.: *See*—
Huber, Johann; and Thanner, Otto, 4,500,325, Cl. 51-298.000.
Tyszkiewicz, Theodore J.: *See*—
Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., 4,500,448, Cl. 252-522.00R.
Ueda, Shuso: *See*—
Ikenoya, Yasuo; Ueda, Shuso; and Araki, Masafumi, 4,499,724, Cl. 60-290.000.
Ueno, Hiroshi: *See*—
Taira, Kazuo; Morofuji, Akihiko; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,500,575, Cl. 428-35.000.
Uhl, Jurgen: *See*—
Hausberg, Hans-Heinrich; Uhl, Jurgen; Seyfried, Christoph; and Minck, Klaus-Otto, 4,500,541, Cl. 514-466.000.
UHV Instruments Ltd.: *See*—
Robinson, James E., 4,499,776, Cl. 73-863.850.
UMC Industries, Inc.: *See*—
Schuller, James T., 4,499,985, Cl. 194-10.000.
Umehara, Mitsuo: *See*—
Matsuoka, Fumio; Iijima, Hitoshi; Yamazaki, Kisuke; Kasagi, Hiroshi; Nakashima, Yasuo; Sakuma, Kiyoshi; and Umehara, Mitsuo, 4,499,739, Cl. 62-212.000.
Umezawa, Hamao; Fujii, Akio; Muraoka, Yasuhiko; Nakatani, Tokuji; Fukuoka, Takeyo; and Takahashi, Katsutoshi, to Nippon Kayaku Kabushiki Kaisha. (Amido)N-substituted bleomycins, salts thereof and process for preparation thereof. 4,500,452, Cl. 260-112.50R.
Union Carbide Corporation: *See*—
Lok, Brent M. T.; Marcus, Bonita K.; and Flanigen, Edith, 4,500,651, Cl. 502-208.000.
Nicholson, Myron D.; and Chiu, Herman; S., 4,500,576, Cl. 428-36.000.
Union Oil Company of California: *See*—
Jost, John W.; and Gallup, Darrell L., 4,500,434, Cl. 210-696.000.
Simpson, Howard D.; Richardson, Ryden L.; and Baron, Kenneth, 4,500,424, Cl. 208-216.0PP.
Unique Functional Products: *See*—
Law, Denny B., 4,500,113, Cl. 280-716.000.
United Security Products, Inc.: *See*—
Greene, Ted R., 4,500,943, Cl. 361-383.000.
United States of America
Agriculture: *See*—
Peters, Penn A.; Biller, Cleveland J.; and Johnson, David D., 4,500,004, Cl. 212-80.000.
Air Force: *See*—
Cole, Eugene O.; and Yeterian, Vahan H., 4,500,206, Cl. 356-376.000.
Moore, George W.; and Carroll, Robert G., 4,499,735, Cl. 60-739.000.
Plank, Vernon G.; Matthews, Anthony J.; Berthel, Robert O.; and LaGross, Dennis L., 4,499,761, Cl. 73-170.00R.
Webb, George, 4,500,255, Cl. 415-189.000.
Army: *See*—
Bosselaers, Robert J.; and Elder, Richard B., 4,500,857, Cl. 332-9.00R.
Conway, Gregory J., 4,499,769, Cl. 73-587.000.
Gutleber, Frank S., 4,500,883, Cl. 343-383.000.
Kaste, Robert P., 4,499,811, Cl. 89-14.500.
Lee, Calvin K.; and Rapacz, Deirdre T., 4,500,592, Cl. 428-251.000.
Majerus, John N.; and Walters, William P., 4,499,830, Cl. 102-476.000.
Morr, Gary F.; and Duncan, William A., 4,500,997, Cl. 372-58.000.
Savioli, Giulio V., 4,499,683, Cl. 42-69.00R.
Smith, David C.; and Noto, Richard, 4,500,963, Cl. 364-300.000.
Commerce: *See*—
Kriz, Ronald D., 4,499,770, Cl. 73-599.000.
Energy: *See*—
Carr, Kenneth R., 4,499,753, Cl. 73-59.000.
Christie, Alan M.; and Snyder, Kurt I., 4,500,487, Cl. 376-283.000.
David, Stan A.; and Woodhouse. John J., 4,499,758, Cl. 73-159.000.
Fontana, Jack J.; and Reams, Walter, 4,500,674, Cl. 524-650.000.
Groh, Edward F.; Cassidy, Dale A.; and Lewandowski, Edward F., 4,500,488, Cl. 376-409.000.
Haas, Wendall M. B., 4,499,772, Cl. 73-666.000.
Hill, Richard W.; Skinner, Dewey F.; and Thorsness, Charles B., 4,499,945, Cl. 166-50.000.
Honodel, Charles A., 4,499,828, Cl. 102-301.000.
Hunt, Arlon J.; Hansen, Leif J.; and Evans, David B., 4,499,893, Cl. 126-449.000.
Hurst, Fred J., Jr., 4,500,493, Cl. 423-10.000.
Jacobson, Albin K.; Rychnovsky, Raymond E.; and Visbeck, Cornelius N., 4,499,829, Cl. 102-378.000.
Jahn, Randy K.; and Liepins, Raimond, 4,500,562, Cl. 427-27.000.
Lewandowski, Edward F.; and Peterson, Leroy L., 4,499,708, Cl. 53-432.000.
Srivastava, Suresh C.; Fawwaz, Rashid A.; and Richards, Powell, 4,500,508, Cl. 424-1.100.
Staiger, M. Daniel, 4,500,231, Cl. 406-198.000.
Sullivan, William N., 4,500,257, Cl. 416-32.000.
Szoke, Abraham; and Prosnitz, Donald, 4,500,843, Cl. 330-4.300.
Whetten, Nathan R.; and Kelley, John E., 4,500,785, Cl. 250-385.000.
Zwick, Stanley A.; and Ackerman, John P., 4,499,663, Cl. 29-623.100.
Health and Human Services: *See*—
Neville, David M., Jr.; and Youle, Richard J., 4,500,637, Cl. 435-2.000.
Interior: *See*—
Campoli, Alan A.; and Garcia, Fred, 4,500,329, Cl. 55-189.000.
Cole, Ernest R., Jr.; Lee, Agnes Y.; and Paulson, Danton L., 4,500,398, Cl. 204-117.000.
National Aeronautics and Space Administration: *See*—
Evans, Jack; and Studer, Philip A., 4,500,265, Cl. 417-417.000.
Yamakawa, Kazuo A., 4,500,492, Cl. 422-199.000.
Navy: *See*—
Beyer, Henry R.; DeSipio, Richard G.; Long, Thomas F.; and Ritz, Joseph, 4,500,885, Cl. 343-456.000.
Insinger, Richard H., III; and Rodemann, Alfred H., 4,500,295, Cl. 434-218.000.
Naubereit, Henry; Beyer, Henry R.; DeSipio, Richard G.; and Picard, Salvatore R., 4,500,884, Cl. 343-456.000.
Naubereit, Henry; Long, Thomas F.; Picard, Salvatore R.; and Ritz, Joseph, 4,500,886, Cl. 343-456.000.
U.S. Philips Corporation: *See*—
Lemaire, Edmond; and Lebreton, Jacques, 4,500,962, Cl. 364-200.000.
Persoon, Eric H. J.; and Abeysekera, Ratnayake M. S. S., 4,501,016, Cl. 382-22.000.
Schemmann, Hugo; and Bertram, Leo, 4,500,825, Cl. 318-792.000.
Schmitz, Herman J. R., 4,500,875, Cl. 340-703.000.
Van Roessel, Frederik J., 4,500,922, Cl. 358-188.000.
U.S. Product Development Company: *See*—
Adell, Robert, 4,499,689, Cl. 49-462.000.
United Stirling AB: *See*—
Bratt, Christer, 4,499,726, Cl. 60-517.000.
Lorant, Stefan, 4,499,727, Cl. 60-525.000.
United Technologies Corporation: *See*—
Bullis, Robert H.; and Couch, Robert P., 4,499,755, Cl. 73-116.000.
Monhardt, Richard J.; Orr, Alfred B.; and Wright, Joseph B., 4,500,252, Cl. 415-9.000.
Murphy, Richard D.; Perez, Ricardo L.; and Clelford, Douglas H., 4,500,967, Cl. 364-434.000.
Veltri, Richard D.; Galasso, Francis S.; and Mendelson, Mel I., 4,500,483, Cl. 264-81.000.
Wilcox, Ernest W.; and Wilson, Jack W., Jr., 4,500,098, Cl. 277-170.000.
Zagranski, Raymond D.; Howlett, James J.; and Lappos, Nicholas D., 4,500,966, Cl. 364-432.000.
Universal Instruments Corporation: *See*—
Ackerman, Daniel W., 4,500,032, Cl. 228-180.00A.
Janisiewicz, Stanley W.; Hills, Maynard J.; and Lovell, Edward J., 4,500,246, Cl. 414-414.000.
University of Alabama for the University of Alabama in Birmingham, The Board of Trustees of the: *See*—
Urry, Dan W., 4,500,700, Cl. 528-328.000.

University of Arizona Foundation: *See*—
Furst, Emanuel F.; Lampe, Louis F.; and Woods, William L., 4,499,903, Cl. 128-675.000.
University of Delaware: *See*—
Bodge, Kevin R.; and Dean, Robert G., 4,499,762, Cl. 73-170.00A.
University of Southern California: *See*—
Feinberg, Jack, 4,500,855, Cl. 332-7.510.
University Patents, Inc.: *See*—
Caruthers, Marvin H.; and Matteucci, Mark D., 4,500,707, Cl. 536-27.000.
Uno, Chiyomatsu, to Komori Printing Machinery Co., Ltd. Ink wiping device for intaglio rotary printing machines. 4,499,825, Cl. 101-167.000.
Uno, Toshihiko: *See*—
Tokitsu, Naoki; Fujiwara, Toshitaka; Kato, Toranosuke; and Uno, Toshihiko, 4,500,868, Cl. 340-52.00F.
Uomala, Vilho; Sandstrom, Kjell; and Matilainen, Jorma, to Oy Wartsila Ab. Valve cover sealing arrangement. 4,500,092, Cl. 277-12.000.
UOP Inc.: *See*—
House, David W., 4,500,740, Cl. 568-796.000.
Polak, Anthony J.; and Beuhler, Allyson J., 4,500,667, Cl. 524-406.000.
Upjohn Company, The: *See*—
VanRheenen, Verlan H., 4,500,461, Cl. 260-397.450.
Urbach, Bernd: *See*—
Girodi, Erich; Bornowski, Gunter; Dejmek, Eberhard; Knabe, Andreas; Koch, Roland; Urbach, Bernd; and Weisselberg, Arnold, 4,500,764, Cl. 219-59.100.
Urban, Joseph, to Crown Cork & Seal Company, Inc. Nitrogen injector system. 4,499,931, Cl. 141-67.000.
Urry, Dan W., to University of Alabama for the University of Alabama in Birmingham, The Board of Trustees of the. Elastomeric composite material comprising a polypentapeptide having an amino acid of opposite chirality in position three. 4,500,700, Cl. 528-328.000.
Usachev, Oleg I.: *See*—
Sidorenko, Georgy I.; Lopato, Georgy P.; Yakubovich, Vladimir M.; Nikitin, Yaroslav G.; Usachev, Oleg I.; and Vorobiev, Anatoly P., 4,499,904, Cl. 128-703.000.
Ushio Denki Kabushiki Kaisha: *See*—
Hiramoto, Tatsumi, 4,500,565, Cl. 427-39.000.
USM Corporation: *See*—
Garner, Derek H., 4,499,622, Cl. 12-14.500.
Hanson, Raymond; and Tillyard, Malcolm, 4,500,773, Cl. 219-215.000.
Maxner, Richard B., 4,499,649, Cl. 29-566.300.
Pope, John R., 4,499,845, Cl. 116-137.00A.
Usui, Sanpei: *See*—
Nishiguchi, Akira; Usui, Sanpei; Oouchi, Tomihisa; and Iwai, Kazumi, 4,499,859, Cl. 122-18.000.
USV Pharmaceutical Corporation: *See*—
Loev, Bernard, Shroff, James R.; and Desai, Rohit, 4,500,527, Cl. 514-223.000.
Loev, Bernard; Jones, Howard; and Shroff, James R., 4,500,528, Cl. 514-228.000.
Loev, Bernard; Jones, Howard; and Suh, John T., 4,500,532, Cl. 514-256.000.
Suh, John T.; Barton, Jeffrey N.; and Regan, John R., 4,500,713, Cl. 546-165.000.
Utagawa, Tadashi: *See*—
Nozaki, Hidetoshi; Kamimura, Takaaki; Hatayama, Tamothu; and Utagawa, Tadashi, 4,500,744, Cl. 136-258.000.
Vaessen, Leonardus M. A.: *See*—
Willemsen, Henricus P.; Vaessen, Leonardus M. A.; and van der Hoorn, Rudolf J. G. A., 4,500,485, Cl. 264-313.000.
Vaisala Oy: *See*—
Kuisma, Heikki T.; Lehto, Ari; and Jalava, Jouko S., 4,500,940, Cl. 361-286.000.
Varkia, Esa, 4,499,763, Cl. 73-170.00R.
Valcom Limited: *See*—
Brandigampola, Don E., 4,500,888, Cl. 343-873.000.
Vallee, Eric: *See*—
Frehel, Daniel; Maffrand, Jean-Pierre; and Vallee, Eric, 4,500,534, Cl. 514-301.000.
Vallis, Keith: *See*—
Ridgewell, Terence E.; and Vallis, Keith, 4,500,120, Cl. 292-19.000.
Vallvey, Juan A.: *See*—
Sole, Carlos M.; and Vallvey, Juan A., 4,500,361, Cl. 106-298.000.
Valyocsik, Ernest W.: *See*—
Rankel, Lillian A.; and Valyocsik, Ernest W., 4,500,503, Cl. 423-329.000.
Van Doorne's Transmissie B.V.: *See*—
Cadee , Theodorus P. M., 4,500,301, Cl. 474-28.000.
van de Kamp, Dieter, to Spanset Inter AG. Endless loop articles of manufacture, straps shaped therefrom, and mats made from such straps. 4,500,578, Cl. 428-36.000.
van den Engh, Gerrit J.; Trask, Barbara J.; and Visser, Johannes W. M., to Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek. Flow cytometer for identifying algae by chlorophyll fluorescence. 4,500,641, Cl. 435-291.000.
van der Hoorn, Rudolf J. G. A.: *See*—
Willemsen, Henricus P.; Vaessen, Leonardus M. A.; and van der Hoorn, Rudolf J. G. A., 4,500,485, Cl. 264-313.000.
Van Derlin, Donald H. Belt clamp for conveyor belts. 4,500,127, Cl. 294-104.000.
Vander Meer, Richard H.: *See*—
Cole, Rodger E.; and Vander Meer, Richard H., 4,500,229, Cl. 406-88.000.
van Dijk, Jacobus C.; and von Michalofski, Erik. Apparatus for electroacoustic energy conversion. 4,501,015, Cl. 381-103.000.
van Dongen, Robert H.; and Stork, Willem H. J., to Shell Oil Company. Process for the preparation of hydrocarbon oil distillates. 4,500,416, Cl. 208-86.000.
Van Hijfte, Willy H. P.; and Vanmarcke, Luc A., to Compagnie Neerlandaise de l'Azote (Societe Anonyme). Process for making granules containing urea as the main component. 4,500,336, Cl. 71-29.000.
Van Leirsburg, Dean A.: *See*—
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,500,495, Cl. 423-53.000.
Vanmarcke, Luc A.: *See*—
Van Hijfte, Willy H. P.; and Vanmarcke, Luc A., 4,500,336, Cl. 71-29.000.
Vann, Roy R., to GEO Vann, Inc. Ball switch device and method. 4,499,951, Cl. 166-297.000.
Van Renssen, Marinus: *See*—
Wilbur, Leonard P., Jr.; and Van Renssen, Marinus, 4,500,767, Cl. 219-78.010.
VanRheenen, Verlan H., to Upjohn Company, The. Cyanohydrin process. 4,500,461, Cl. 260-397.450.
Van Roessel, Frederik J., to U.S. Philips Corporation. Synchronous demodulation circuit for a carrier which is amplitude-modulated by a video signal. 4,500,922, Cl. 358-188.000.
Varga, John M. Carding engine. 4,499,632, Cl. 19-98.000.
Varga, John M. J. Gas compressor or blower. 4,499,814, Cl. 92-169.000.
Varian Associates, Inc.: *See*—
Boys, Donald R.; and Graves, Walter E., 4,500,407, Cl. 204-298.000.
Boys, Donald R.; and Smith, Robert M., 4,500,408, Cl. 204-298.000.
Boys, Donald R.; and Graves, Walter E., 4,500,409, Cl. 204-298.000.
Fruzzetti, Paul R.; Leavitt, Philip J.; and Nuzzi, Frank J., 4,499,752, Cl. 73-40.700.
Varkia, Esa, to Vaisala Oy. Means for attaching a sounding balloon. 4,499,763, Cl. 73-170.00R.
Varteresian, Michael G.; and Steele, S. Robert, to Raytheon Company. Semiconductor structures and manufacturing methods. 4,499,659, Cl. 29-589.000.
Vassiliou, Eustathios. Hollow wall anchor. 4,500,238, Cl. 411-30.000.
VDO Adolf Schindling AG: *See*—
Nickol, Friedrich W.; and Baeger, Holm, 4,500,611, Cl. 428-686.000.
VEB Gaskombinat Schwarze Pumpe: *See*—
Girodi, Erich; Bornowski, Gunter; Dejmek, Eberhard; Knabe, Andreas; Koch, Roland; Urbach, Bernd; and Weisselberg, Arnold, 4,500,764, Cl. 219-59.100.
VEGA Grieshaber GmbH & Co. KG: *See*—
Benz, Karl; and Kech, Gunter, 4,499,765, Cl. 73-290.00V.
Veltri, Richard D.; Galasso, Francis S.; and Mendelson, Mel I., to United Technologies Corporation. Manufacture of hollow CVD silicon nitride articles. 4,500,483, Cl. 264-81.000.
Vermilyea, Mark E., to General Electric Company. Winding support and method for NMR magnet axisymmetric correction coils. 4,500,860, Cl. 335-216.000.
Vermont Castings, Inc.: *See*—
Syme, Duncan C., 4,499,889, Cl. 126-75.000.
Vettiger, Peter: *See*—
Bretscher, Erwin; and Vettiger, Peter, 4,500,790, Cl. 250-492.200.
Vezirian, Edward; Quinones, Richard J.; and Lockstedt, Alan W., to Smith International, Inc. Composite bearing. 4,499,642, Cl. 29-149.50R.
Victor Company of Japan, Ltd.: *See*—
Machida, Toyotaka, 4,500,909, Cl. 358-17.000.
Sugiyama, Hiroyuki, 4,500,981, Cl. 369-43.000.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,500,983, Cl. 369-77.200.
Vilen, Erik O., to Blakeslee, A division of Blako, Inc. Mixing apparatus. 4,500,210, Cl. 366-207.000.
Villax, Ivan; and Page, Philip R., to Plurichemie Anstalt. New improved process for the preparation of α-6-deoxytetracyclines. 4,500,458, Cl. 260-351.500.
Vinarub, Edmond I.: *See*—
Krohn, David A.; Buffone, Louis A.; and Vinarub, Edmond I., 4,500,870, Cl. 340-347.00P.
Viola, Gian T.: *See*—
Caporiccio, Gerardo; Viola, Gian T.; and Corti, Costante, 4,500,739, Cl. 568-677.000.
Virupaksha, Krishnamoorthy; and Suyderhoud, Henri G., to Communications Satellite Corporation. Adaptive gain variable bit rate NIC processor. 4,500,842, Cl. 328-150.000.
Virupaksha, Krishnamoorthy; and Campanella, Samuel J., to Communications Satellite Corporation. Variable slope delta coding processor using adaptive prediction. 4,501,001, Cl. 375-30.000.
Visbeck, Cornelius N.: *See*—
Jacobson, Albin K.; Rychnovsky, Raymond E.; and Visbeck, Cornelius N., 4,499,829, Cl. 102-378.000.
Visek, Tomas, to Steyr-Daimler-Puch Aktiengesellschaft. Reciprocating internal combustion engine. 4,499,869, Cl. 123-195.00C.
Visser, Johannes W. M.: *See*—
van den Engh, Gerrit J.; Trask, Barbara J.; and Visser, Johannes W. M., 4,500,641, Cl. 435-291.000.

Vlahek, Josip: *See—*
Bullock, Lance W.; Vlahek, Josip; and Kovacs, Ferenc, 4,500,277, Cl. 425-387.100.
Vlattas, Isidoros, to Ciba-Geigy Corporation. Process for preparing imidazobenzothiadiazepines. 4,500,472, Cl. 260-245.500.
Vobornik, Vaclav: *See—*
Junek, Jan; Skarka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Hacova, Kveta; Vobornik, Vaclav; Ohlidal, Vladimi; and Lihtarova, Ludmila, 4,499,718, Cl. 57-301.000.
Vock, Jurgen; Pinck, Peter; Lange, Norbert; Schmalfeld, Erwin; and Petersen, Kurt-Eckard, to Hauni-Werke Korber & Co. KG. Apparatus for making perforations in running webs of paper or the like. 4,500,770, Cl. 219-121.0LK.
Vogelesang, Laurens B.: *See—*
Schijve, Jacobus; Vogelesang, Laurens B.; and Marissen, Roelof, 4,500,589, Cl. 428-213.000.
Volin, Frank. Wheelchair width adjuster. 4,500,109, Cl. 280-650.000.
Volkswagenwerk Aktiengesellschaft: *See—*
Oetting, Hermann; and Heidemeyer, Paulus, 4,499,965, Cl. 180-165.000.
Vollmer, Rudolf, to Honeywell Inc. Actuating mechanism. 4,500,036, Cl. 236-68.00B.
Vollmer Werke Maschinenfabrik GmbH: *See—*
Beck, Ernst; Lenard, Peter; and Pokorny, Erich, 4,499,794, Cl. 76-75.000.
von Halasz, Sigmar: *See—*
Engelhardt, Friedrich; Kuhlein, Klaus; Riegel, Ulrich; von Halasz, Sigmar; Dawson, Jeffery C.; and Reed, Anthony R., 4,500,437, Cl. 252-8.55C.
von Michalofski, Erik: *See—*
van Dijk, Jacobus C.; and von Michalofski, Erik, 4,501,015, Cl. 381-103.000.
von Weissenfluh, Hans C., to Hawe-Neos Dental Dr. H. v. Weissenfluh S.A. Angular mold for dental use. 4,500,288, Cl. 433-40.000.
Vorobiev, Anatoly P.: *See—*
Sidorenko, Georgy I.; Lopato, Georgy P.; Yakubovich, Vladimir M.; Nikitin, Yaroslav G.; Usachev, Oleg I.; and Vorobiev, Anatoly P., 4,499,904, Cl. 128-703.000.
Vorwald, Josef: *See—*
Braitsch, Hans; Ortwein, Hermann; and Vorwald, Josef, 4,500,037, Cl. 238-2.000.
Voza, Alfonse N., to Singer Company, The. Pattern data storage by equations in an electronically controlled sewing machine. 4,499,838, Cl. 112-266.100.
Vredestein N.V.: *See—*
Willemsen, Henricus P.; Vaessen, Leonardus M. A.; and van der Hoorn, Rudolf J. G. A., 4,500,485, Cl. 264-313.000.
Vsesojuzny Nauchno-Issledovatelsky Institut Burovoi Technici: *See—*
Zsoka, Istvan; Madar, Laszlo ; Cubin, Anatoly A.; Gaivoronsky, Albert A.; Farukshin, Lev H.; Morzsic, Piotr A.; Lisov, Aleksandr I.; and Galusztainc, Vladilen A., 4,499,947, Cl. 166-179.000.
Vuong, Dinh-Cuong, to Texaco Inc. Method of reducing the nickel content in waste water. 4,500,324, Cl. 48-197.00R.
Vyzkumny ustav bavlnarsky: *See—*
Junek, Jan; Skarka, Josef; Jaros, Frantisek; Hortlik, Frantisek; Hacova, Kveta; Vobornik, Vaclav; Ohlidal, Vladimi; and Lihtarova, Ludmila, 4,499,718, Cl. 57-301.000.
W. H. Brady Co.: *See—*
Downing, Gerald T.; and Schaefer, Karl P., 4,500,223, Cl. 402-20.000.
W. R. Grace Australia Limited: *See—*
Bullock, Lance W.; Vlahek, Josip; and Kovacs, Ferenc, 4,500,277, Cl. 425-387.100.
W. R. Grace & Co.: *See—*
Guthrie, James L.; and Wojcik, Ronald T., 4,500,703, Cl. 523-400.000.
W. Schlafhorst & Co.: *See—*
Chardon, Manfred; Mauries, Reinhard; Rohner, Joachim; and Zumfeld, Heinz, 4,499,715, Cl. 57-22.000.
Wada, Minoru; Takahashi, Yonosuke; and Hasegawa, Eiichi, to Fuji Photo Film Co., Ltd. Method for recording light information. 4,500,889, Cl. 346-1.100.
Wada, Noriaki, to Bando Chemical Industries, Ltd. Rubber composition containing non-tackiness-imparting agent and conveyor belt having surface layer made of vulcanizate of said composition. 4,500,666, Cl. 524-232.000.
Wade, James C.: *See—*
McDonald, Daniel P.; and Wade, James C., 4,500,502, Cl. 423-321.00R.
Waggoner, Dennis H. Lumber assembly machine. 4,500,385, Cl. 156-380.400.
Wagner, Hans: *See—*
Goyert, Wilhelm; Grimm, Wolfgang; Awater, Albert; Wagner, Hans; and Kruger, Bruno, 4,500,671, Cl. 524-494.000.
Wagner, James B.: *See—*
Medeiros, Charles W.; and Wagner, James B., 4,499,756, Cl. 73-118.000.
Waine, Martin; Rude, Edward T.; and Nisenson, Jules, to General Clutch Corp. Window shade system for reducing heat transport through windows. 4,499,937, Cl. 160-41.000.
Waite & Son Limited: *See—*
Clading-Boel, John P., 4,500,222, Cl. 401-209.000.
Wakayama, Masao; Takemura, Makoto; and Kasagi, Takao, to Nippon Soken, Inc. Sliding member made of fiber-reinforced metal. 4,500,360, Cl. 106-286.500.
Wakeman, Philip E. D., to Canada, Her Majesty in Right of. Spectrum surveillance receiver system. 4,501,020, Cl. 455-226.000.
Wako Pure Chemical Industries, Ltd.: *See—*
Tanaka, Motoaki; Toyama, Takanori; Ohba, Hitoshi; and Yamaguchi, Osamu, 4,500,649, Cl. 502-167.000.
Walbro Corporation: *See—*
Tuckey, Charles H., 4,500,270, Cl. 418-133.000.
Walker, Aubrey D.: *See—*
Ferro, Berkeley M.; and Walker, Aubrey D., 4,500,116, Cl. 283-92.000.
Walker, Ewald: *See—*
Backe, Egbert; Muller, Rolf; Otto, Dieter; Leonardi, Cornelio; Kochendorfer, Heinrich; Fussner, Paul; Walker, Ewald; and Rommel, Rudi, 4,499,757, Cl. 73-119.00A.
Walker, Gary: *See—*
Westhaver, Robert O.; Walker, Gary; and Koning, Menno G., 4,499,778, Cl. 74-5.00F.
Walker, Robert A.: *See—*
Austin, James W.; Bradburn, Ronald G.; Cromwell, Clarence A.; Gratch, Eitan; Groiss, Erich; Perkins, Derek; and Walker, Robert A., 4,500,496, Cl. 423-55.000.
Walrath, Craig D., to Westinghouse Electric Corp. Electro-optical tracking system with adaptive bearing friction compensation. 4,500,823, Cl. 318-632.000.
Walsham, Brian E.: *See—*
Szczupak, David T.; Walsham, Brian E.; Hooley, Desmond J.; Flaxington, David; McKean, Peter S.; and Wescott, John D., 4,499,732, Cl. 60-602.000.
Walters, John P., to Phillips Petroleum Company. Method for storing gas samples. 4,499,930, Cl. 141-8.000.
Walters, William P.: *See—*
Majerus, John N.; and Walters, William P., 4,499,830, Cl. 102-476.000.
Wang, Han-Chiu: *See—*
Ren, Chung-Li; Thompson, Matthew V.; and Wang, Han-Chiu, 4,500,859, Cl. 333-208.000.
Wang, Ke-Chin: *See—*
Winkelbauer, Howard M.; Hill, Kenneth W.; and Wang, Ke-Chin, 4,500,644, Cl. 501-98.000.
Wang, Nui, to Girlock Limited. Integral park brake mechanism. 4,499,977, Cl. 188-72.600.
Wangner Systems Corporation: *See—*
Smith, Richard W., 4,500,590, Cl. 428-222.000.
Ward, Connie T. Shadecloth fixing pin. 4,499,635, Cl. 24-150.00R.
Ward, Henry D., Jr.; and West, John B., to Ward Machinery Company, The. Blank stacking apparatus. 4,500,243, Cl. 414-50.000.
Ward Machinery Company, The: *See—*
Sardella, Louis M.; and Ward, William F., Sr., 4,500,244, Cl. 414-92.000.
Ward, Henry D., Jr.; and West, John B., 4,500,243, Cl. 414-50.000.
Ward, Michael A. V.; and Lefevre, Robert P., to Combustion Electromagnetics, Inc. Ultra lean burn carburetted adiabatic engine. 4,499,872, Cl. 123-344.000.
Ward, William F., Sr.: *See—*
Sardella, Louis M.; and Ward, William F., Sr., 4,500,244, Cl. 414-92.000.
Ward, William J., III; Ritzer, Alan; Carroll, Kenneth M.; and Flock, John W., to General Electric Company. Method for making alkylhalosilanes. 4,500,724, Cl. 556-472.000.
Warner-Lambert Company: *See—*
Mayer, Jean P.; and Wittwer, Fritz, 4,500,358, Cl. 106-122.000.
Watanabe, Hideo: *See—*
Kubo, Keishi; Watanabe, Hideo; Takigawa, Nobuhiro; Hagiri, Minoru; and Kawasaki, Kanjiro, 4,500,896, Cl. 346-204.000.
Watanabe, Hiroshi: *See—*
Akano, Shinichi; Goto, Tsutomu; Watanabe, Hiroshi; Kuroda, Masato; Ishikawa, Sakae; and Matsumoto, Ryoichiro, 4,499,754, Cl. 73-861.120.
Watanabe, Katsunori: *See—*
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,500,619, Cl. 430-59.000.
Watanabe, Norio: *See—*
Suzuki, Akira; Shioya, Yasumi; Watanabe, Norio; and Kimura, Keiichi, deceased, 4,500,427, Cl. 210-608.000.
Watanabe, Shinichiro, to Japan Spectroscopic Co., Ltd. Spectrophotometer. 4,500,205, Cl. 356-325.000.
Watanabe, Takashi; and Miyatake, Shigehiro, to Sharp Kabushiki Kaisha. Color imaging array and color imaging device. 4,500,914, Cl. 358-44.000.
Watanabe, Yoshikazu: *See—*
Menjo, Hiroshi; and Watanabe, Yoshikazu, 4,500,633, Cl. 430-505.000.
Watkins, Bruce J., to Hughes Tool Company. Wellhead stabilization. 4,499,950, Cl. 166-285.000.
Watkins, William L. H.: *See—*
Gandhi, Haren S.; and Watkins, William L. H., 4,499,863, Cl. 123-3.000.
Waukesha Cutting Tools, Inc.: *See—*
Orth, Eugene C.; and Ebenhoch, Sebastian, 4,500,234, Cl. 408-206.000.
Webb, George, to United States of America, Air Force. Spacer structure. 4,500,255, Cl. 415-189.000.
Webb, Leigh S.: *See—*
Older, Geoffrey I.; and Webb, Leigh S., 4,499,740, Cl. 62-374.000.
Weber, James L., to Rockwell International Corporation. Slack adjuster for a disc brake. 4,499,976, Cl. 188-71.900.

Weber, John W. Protective fabric and fire curtain with a metallic laminate. 4,500,593, Cl. 428-257.000.
Weedall, Dennis L. Lighting system. 4,500,813, Cl. 315-276.000.
Weetall, Howard H., to Corning Glass Works. Wine stabilization using immobilized tannic acid. 4,500,554, Cl. 426-323.000.
Weiss, Edward L., to General Signal Corporation. Fiber optic data highway. 4,501,021, Cl. 455-601.000.
Weisselberg, Arnold: *See—*
Girodi, Erich; Bornowski, Gunter; Dejmek, Eberhard; Knabe, Andreas; Koch, Roland; Urbach, Bernd; and Weisselberg, Arnold, 4,500,764, Cl. 219-59.100.
Weissenbach, Joseph, deceased; and by Shahrokh-Khani, Jane A., executor. Supplemental system for fuel agency. 4,499,885, Cl. 123-525.000.
Wells, Rickey D.: *See—*
Bagwell, Bobby F.; and Wells, Rickey D., 4,500,071, Cl. 254-423.000.
Welt, Martin J.: *See—*
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
Welty, Kenneth B.: *See—*
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Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
Wenger, Martin: *See—*
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Wenger, Richard M.: *See—*
Gerteisen, Steven R.; Wenger, Richard M.; and Cannavo, Glenn M., 4,500,595, Cl. 428-294.000.
Werner, Lester W. Adjustable bed with single crank and push-button control assembly. 4,499,618, Cl. 5-68.000.
Werner Looser Maschinenbau+Hydraulik: *See—*
Lampert, Heinz, 4,499,813, Cl. 92-31.000.
Wescott, John D.: *See—*
Szczupak, David T.; Walsham, Brian E.; Hooley, Desmond J.; Flaxington, David; McKean, Peter S.; and Wescott, John D., 4,499,732, Cl. 60-602.000.
West, C. Thomas; and Basalay, Robert J., to Standard Oil Company (Indiana). Hydrocarbon-soluble polyamine-molybdenum compositions, lubricants and gasoline containing same. 4,500,439, Cl. 252-46.400.
West, Jana L.: *See—*
Grappendorf, Richard H.; and West, Jana L., 4,499,959, Cl. 175-330.000.
West, John B.: *See—*
Ward, Henry D., Jr.; and West, John B., 4,500,243, Cl. 414-50.000.
West Point Pepperell, Inc.: *See—*
Pacifici, Joseph A.; and Bryant, Clifford A., 4,500,039, Cl. 239-193.000.
Western Geophysical Co of America: *See—*
Scott, Gary L., 4,500,979, Cl. 367-149.000.
Westhaver, Robert O.; Walker, Gary; and Koning, Menno G., to Northrop Corporation. Flexure mount assembly for a dynamically tuned gyroscope and method of manufacturing same. 4,499,778, Cl. 74-5.00F.
Westinghouse Electric Corp.: *See—*
Anderson, William C.; Boundy, Bruce K.; and Schoumaker, Raoul J. P., 4,500,060, Cl. 248-349.000.
De Lorenzi, John J.; and Sumka, Elmer H., 4,499,973, Cl. 187-29.000.
Killingsworth, Emmett D., 4,500,779, Cl. 250-231.0SE.
Kub, Francis J.; and Evey, William M., 4,499,653, Cl. 29-571.000.
Miller, Richard A., 4,500,771, Cl. 219-121.0LH.
Nguyen, Tac H.; and Husson, Alan L., 4,499,974, Cl. 187-29.00R.
Putman, Richard E., 4,500,950, Cl. 364-138.000.
Schaff, Fredrick L.; and Gottlieb, Milton, 4,500,175, Cl. 350-358.000.
Shuey, Kenneth C.; and Doughman, Charles L., 4,500,837, Cl. 324-102.000.
Shum, Lanson Y., 4,499,784, Cl. 74-479.000.
Specht, Theodore R.; and Cham, Edward J., 4,500,829, Cl. 323-215.000.
Thomas, Charles H., 4,500,689, Cl. 525-442.000.
Walrath, Craig D., 4,500,823, Cl. 318-632.000.
Westvaco Corporation: *See—*
DeLigt, John, 4,500,376, Cl. 156-159.000.
Weyand, John D.; Woods, Robert W.; DeYoung, David H.; and Ray, Siba P., to Aluminum Company of America. Inert electrode connection. 4,500,406, Cl. 204-293.000.
Whetten, Nathan R.; and Kelley, John E., to United States of America, Energy. Radiation detector having a multiplicity of individual detecting elements. 4,500,785, Cl. 250-385.000.
Whicker, Jerry T.: *See—*
Bloome, James A.; Meeker, Rick A.; Whicker, Jerry T.; and Foreman, Frederick J., 4,499,624, Cl. 15-97.00R.
Whirlpool Corporation: *See—*
Platt, Clark I., 4,499,628, Cl. 15-419.000.
Whitaker, Angus H.; McFarland, Keith E.; Lloyd, William A.; and Patrick, Willard J., to Xerox Corporation. Laterally translatable roll apparatus. 4,500,045, Cl. 242-57.100.
Whitcomb, David R., to Minnesota Mining and Manufacturing Company. Chelating polymers for modifying metal surface properties. 4,500,601, Cl. 428-403.000.
White, Jonathan C., to AT&T Bell Laboratories. Bromine anti-stokes raman laser. 4,500,995, Cl. 372-3.000.
White, William H.: *See—*
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Whitehall Corporation: *See—*
Copeland, James R., 4,500,980, Cl. 367-154.000.
Wiatrak, Thomas R.: *See—*
Haury, Gilbert E.; Patel, Nathalal G.; Lockard, Walter G.; and Wiatrak, Thomas R., 4,500,102, Cl. 280-242.0WC.
Wiechert, Rudolf: *See—*
Nickisch, Klaus; Bittler, Dieter; Laurent, Henry; Wiechert, Rudolf; and Losert, Wolfgang, 4,500,522, Cl. 514-173.000.
Wiegand, Herbert; and Baumer, Klaus, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Method and apparatus for the injection of alcohol fuels, more particularly for direct injection diesel engines. 4,499,861, Cl. 123-1.00A.
Wiegand, Herbert: *See—*
Baumer, Klaus; and Wiegand, Herbert, 4,499,862, Cl. 123-1.00A.
Wiegmann, Thomas B.: *See—*
Diederich, Dennis A.; Wiegmann, Thomas B.; and Pinnick, Robert V., 4,500,309, Cl. 604-5.000.
Wierschke, Donald J., to RCA Corporation. Method for the manufacture of record stampers. 4,500,393, Cl. 204-5.000.
Wikholm, Bert S., to Alfa-Laval AB. Apparatus for regulation of gas feed for gas consumption. 4,500,322, Cl. 48-191.000.
Wilbur, Leonard P., Jr.; and Van Renssen, Marinus, to RCA Corporation. Shadow mask washer/spring welding apparatus. 4,500,767, Cl. 219-78.010.
Wilcox, Ernest W.; and Wilson, Jack W., Jr., to United Technologies Corporation. Gas seal for rotating components. 4,500,098, Cl. 277-170.000.
Wilhelm, John R. Water closet modifications. 4,499,617, Cl. 4-441.000.
Willemsen, Henricus P.; Vaessen, Leonardus M. A.; and van der Hoorn, Rudolf J. G. A., to Vredestein N.V. Method for the production of a hose of a shape-cured elastomeric material, such as vulcanized rubber, especially an automotive radiator coolant hose. 4,500,485, Cl. 264-313.000.
Williams International Corporation: *See—*
Hall, Robert T., 4,499,940, Cl. 164-36.000.
Williams, John W., to Boeing Company, The. Strut steering and retracting apparatus. 4,499,843, Cl. 114-280.000.
Williams, Richard A.: *See—*
Liggett, Louis G.; Lang, Kevin W.; Wyss, Clement R.; and Williams, Richard A., 4,500,553, Cl. 426-101.000.
Wilson, David A., to Dow Chemical Company, The. Metal ion control agents based on dicyclopentadiene derivatives. 4,500,470, Cl. 260-502.50E.
Wilson, David A.: *See—*
Crump, Druce K.; Simon, Jaime; and Wilson, David A., 4,500,356, Cl. 106-90.000.
Simon, Jaime; Crump, Druce K.; and Wilson, David A., 4,500,469, Cl. 260-502.50E.
Wilson, Edgar R.: *See—*
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Wilson, Jack W., Jr.: *See—*
Wilcox, Ernest W.; and Wilson, Jack W., Jr., 4,500,098, Cl. 277-170.000.
Wilson, James M., to Ferro Corporation. Temperature stable monolithic capacitors and ceramic compositions for producing same. 4,500,942, Cl. 361-320.000.
Wilson, Kentner B.: *See—*
Cannon, Lee E.; and Wilson, Kentner B., 4,499,650, Cl. 29-568.000.
Wilson, Neill R. Self-adjusting locking wrench. 4,499,797, Cl. 81-367.000.
Wimnell, Nils-Erik: *See—*
Gasparini, Aldo; and Wimnell, Nils-Erik, 4,499,892, Cl. 126-446.000.
Windmoller & Holscher: *See—*
Regge, Dieter, 4,499,826, Cl. 101-181.000.
Winkelbauer, Howard M.; Hill, Kenneth W.; and Wang, Ke-Chin, to Dresser Industries, Inc. Preparation and composition of sialon grain and powder. 4,500,644, Cl. 501-98.000.
Winters, Giorgio; Sala, Alberto; and Barone, Domenico, to Gruppo Lepetit S.p.A. Pharmacologically active pyrazolo/4,3-c/pyridines. 4,500,525, Cl. 514-210.000.
Wion, Donald A.: *See—*
Brown, Christopher K.; Kensinger, Lex D.; Over, William R.; and Wion, Donald A., 4,499,648, Cl. 29-564.200.
Wisconsin Alumni Research Foundation: *See—*
DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, 4,500,460, Cl. 260-397.200.
Wisowaty, James C.; Swaringen, Roy A.; and Yeowell, David A., to Burroughs Wellcome Co. Synthesis of leucovorin. 4,500,711, Cl. 544-258.000.
Witman, Mark W.: *See—*
Schmidt, Manfred; Witman, Mark W.; Reinert, Gerard E.; and Lim, In C., 4,500,653, Cl. 521-90.000.

Wittrowsky, Gunter: *See*—
Kuhnke, Klaus; Bege, Dietmar; Puthawala, Anwer; and Wittrowsky, Gunter, 4,500,449, Cl. 252-628.000.
Wittwer, Fritz: *See*—
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WOCO Franz-Josef Wolf & Co.: *See*—
Wolf, Franz-Josef; and Pletsch, Hubert, 4,500,300, Cl. 464-83.000.
Woenker, William E., to Chem-Elec, Inc. Strip material take-up apparatus. 4,500,046, Cl. 242-67.10R.
Wohlgemuth, Juergen; and Hohmann, Eugen, to Siemens Aktiengesellschaft. Percussion instrument. 4,499,906, Cl. 128-776.000.
Wojcik, Ronald T.: *See*—
Guthrie, James L.; and Wojcik, Ronald T., 4,500,703, Cl. 523-400.000.
Wojtanek, Guy A., to Singer Company, The. Expanded interval timer drive mechanism. 4,500,212, Cl. 368-108.000.
Wolf, Franz-Josef; and Pletsch, Hubert, to WOCO Franz-Josef Wolf & Co. Rotationally elastic coupling. 4,500,300, Cl. 464-83.000.
Wolfe, David L., to Dow Chemical Company, The. Elastomeric polyether-containing impact polymer products. 4,500,687, Cl. 525-412.000.
Woltersdorf, Otto W., to Merck & Co., Inc. Benzothiazolesulfonamide derivatives for the topical treatment of elevated intraocular pressure. 4,500,538, Cl. 514-367.000.
Wong, Dennis W. Diagnostic composition for radiologic imaging of neoplasms in the body and method of preparation. 4,500,507, Cl. 424-1.100.
Wong, Did-Bun, to R. R. Donnelley & Sons Company. Collating and binding system and method with postage indication. 4,500,083, Cl. 270-54.000.
Wong, Robert; Flautt, Martin C.; and Haines, Richard M., to Owens-Corning Fiberglas Corporation. Size composition for glass fibers. 4,500,600, Cl. 428-391.000.
Wong, Stephen S.: *See*—
Chen, Nai Y.; Haag, Werner O.; Huang, Tracy J.; and Wong, Stephen S., 4,500,417, Cl. 208-111.000.
Woo, Ji Y., to Bendix Corporation, The. Suspension assembly for a wheel and brake. 4,500,111, Cl. 280-688.000.
Wood, Godfrey A.: *See*—
Dyett, Derek H.; Wood, Godfrey A.; and Seim, Albert D., II, 4,499,910, Cl. 131-95.000.
Woodard, Kenneth E., Jr.: *See*—
Ford, James M.; Dean, Robert A.; Woodard, Kenneth E., Jr.; and Branco, Antonio, 4,500,379, Cl. 156-172.000.
Woodhouse, John J.: *See*—
David, Stan A.; and Woodhouse, John J., 4,499,758, Cl. 73-159.000.
Woods, John H.; Graves, Toby R.; Nasser, William E.; and Jagtap, Ashvinkumar N., to Petrolite Corporation. Wax composition useful as a beeswax substitute. 4,500,359, Cl. 106-270.000.
Woods, Robert W.: *See*—
Weyand, John D.; Woods, Robert W.; DeYoung, David H.; and Ray, Siba P., 4,500,406, Cl. 204-293.000.
Woods, William L.: *See*—
Furst, Emanuel F.; Lampe, Louis F.; and Woods, William L., 4,499,903, Cl. 128-675.000.
Woodward, Robert B.: *See*—
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,500,457, Cl. 260-245.20R.
Worley, William S., Jr.: *See*—
Heller, Andrew R.; and Worley, William S., Jr., 4,500,952, Cl. 364-200.000.
Wormser, Alex F., to Wormser Engineering, Inc. Fluidized bed fuel burning. 4,499,857, Cl. 122-4.00D.
Wormser Engineering, Inc.: *See*—
Wormser, Alex F., 4,499,857, Cl. 122-4.00D.
Wright, Harold A., to Atlantic Richfield Company. Process for bead size control in vinyl aromatic suspension polymerization using sodium polystyrenesulphonate. 4,500,692, Cl. 526-201.000.
Wright, Joseph B.: *See*—
Monhardt, Richard J.; Orr, Alfred B.; and Wright, Joseph B., 4,500,252, Cl. 415-9.000.
Wright State University: *See*—
Petrofsky, Jerrold S.; Phillips, Chandler A.; Glaser, Roger M.; and Heaton, Harry H., III, 4,499,900, Cl. 128-423.00W.
Wuerzer, Bruno: *See*—
Becker, Rainer; Theobald, Hans; Schirmer, Ulrich; Spiegler, Wolfgang; Seufert, Walter; and Wuerzer, Bruno, 4,500,340, Cl. 71-90.000.
Wurster, Herbert K., to Ricoh Systems, Inc. Sensitive electrophotographic plates containing squaric acid methine dyes suspended in a binder. 4,500,621, Cl. 430-72.000.
Wyatt, Michael; Leach, Gary M.; and Gould, Ashley M., to Johnson Matthey Public Limited Company. Three-way catalysts for purification of exhaust gas and method for the preparation of the catalysts. 4,500,650, Cl. 502-204.000.
Wyss, Clement R.: *See*—
Liggett, Louis G.; Lang, Kevin W.; Wyss, Clement R.; and Williams, Richard A., 4,500,553, Cl. 426-101.000.
Wyvratt, Jean M., to Merck & Co., Inc. Hydrogenation of 3-trichlorovinylnitrobenzene. 4,500,736, Cl. 564-417.000.
Xerox Corporation: *See*—
Garavuso, Gerald M., 4,500,086, Cl. 271-225.000.
Kopko, John J.; and Hays, Dan A., 4,499,851, Cl. 118-658.000.
Whitaker, Angus H.; McFarland, Keith E.; Lloyd, William A.; and Patrick, Willard J., 4,500,045, Cl. 242-57.100.
Yabuki, Yoshiharu: *See*—
Naito, Hideki; and Yabuki, Yoshiharu, 4,500,627, Cl. 430-203.000.
Yagihara, Morio: *See*—
Sakanoue, Kei; Yagihara, Morio; Ichijima, Seigi; and Nagao, Kimitoshi, 4,500,634, Cl. 430-544.000.
Yakubovich, Vladimir M.: *See*—
Sidorenko, Georgy I.; Lopato, Georgy P.; Yakubovich, Vladimir M.; Nikitin, Yaroslav G.; Usachev, Oleg I.; and Vorobiev, Anatoly P., 4,499,904, Cl. 128-703.000.
Yamachika, Hiroshi; and Nakanishi, Hirotoshi, to Sumitomo Chemical Company Limited. Process for producing benzaldehydes. 4,500,721, Cl. 549-362.000.
Yamada, Jun: *See*—
Yuhara, Akitsuna; Hosaka, Norio; Fujita, Yuji; Kishimoto, Kiyoharu; and Yamada, Jun, 4,500,807, Cl. 310-313.00B.
Yamada, Mitsuhiko, to Dainippon Screen Seizo Kabushiki Kaisha. Method of filing set-up data for a photo-electric scanner and an apparatus for reading such data in the form of graphs. 4,500,917, Cl. 358-75.000.
Yamada, Muneki: *See*—
Maruhashi, Yoshitsugu; Kano, Fumio; Yamada, Muneki; and Hirata, Sadao, 4,500,677, Cl. 525-57.000.
Yamaguchi, Hisao: *See*—
Suzuki, Yoji; Imaizumi, Atsushi; Yamaguchi, Hisao; Kanesaki, Masaharu; and Ono, Shoji, 4,500,639, Cl. 435-244.000.
Yamaguchi, Osamu: *See*—
Tanaka, Motoaki; Toyama, Takanori; Ohba, Hitoshi; and Yamaguchi, Osamu, 4,500,649, Cl. 502-167.000.
Yamakawa, Kazuo A., to United States of America, National Aeronautics and Space Administration. Apparatus and method to keep the walls of a free-space reactor free from deposits of solid materials. 4,500,492, Cl. 422-199.000.
Yamamiya, Kazuo: *See*—
Shimizu, Senzo; Nomura, Isao; Yamamiya, Kazuo; and Masuda, Tsuneaki, 4,500,668, Cl. 524-427.000.
Yamamoto, Akira, to Tokai Carbon Co., Ltd. Process for preparing silicon carbide whiskers. 4,500,504, Cl. 423-345.000.
Yamamoto, Kimihiko; and Ishikawa, Hitoshi, to Aisin Seiki Kabushiki Kaisha. Stitch pattern selector in sewing machines. 4,499,837, Cl. 112-158.00A.
Yamamoto, Yoshihisa, to Nippondenso Co., Ltd. Fuel injection control for internal combustion engines. 4,499,876, Cl. 123-446.000.
Yamamoto, Yoshio: *See*—
Yemoto, Jiichiro; Tarao, Ryokichi; and Yamamoto, Yoshio, 4,500,725, Cl. 556-482.000.
Yamamura, Nobuo: *See*—
Takahashi, Osamu; Yamamura, Nobuo; Mukunoki, Yasuo; Ogawa, Shungi; and Nakagawa, Yutaka, 4,500,362, Cl. 106-309.000.
Yamanaka, Akira, to Minolta Camera Kabushiki Kaisha. Photography modes switchable camera. 4,500,191, Cl. 354-418.000.
Yamanaka, Mithuyuki: *See*—
Hayashi, Yutaka; Yamanaka, Mithuyuki; Iida, Hideyo; Shiba, Nobuyasu; Karasawa, Hideyuki; Mishuku, Toshio; and Itou, Atsuo, 4,500,743, Cl. 136-258.000.
Yamasaki, Masafumi, to Olympus Optical Co., Ltd. Automatic exposure controller for a camera. 4,500,192, Cl. 354-427.000.
Yamatake-Honeywell Co., Ltd.: *See*—
Akano, Shinichi; Goto, Tsutomu; Watanabe, Hiroshi; Kuroda, Masato; Ishikawa, Sakae; and Matsumoto, Ryoichiro, 4,499,754, Cl. 73-861.120.
Yamazaki, Kisuke: *See*—
Matsuoka, Fumio; Iijima, Hitoshi; Yamazaki, Kisuke; Kasagi, Hiroshi; Nakashima, Yasuo; Sakuma, Kiyoshi; and Umehara, Mitsuo, 4,499,739, Cl. 62-212.000.
Yambe, Teluo: *See*—
Kubota, Hitoshi; Hamamatsu, Seiji; Yambe, Teluo; and Takahashi, Toshiyuki, 4,500,761, Cl. 200-84.00C.
Yarnitzky, Chaim N., to Technion Research & Development Foundation Ltd., a part interest. Automatically operated polarographic analyzer. 4,500,411, Cl. 204-413.000.
Yarrow, Harry A. Ankle joint and coupling for artificial limbs. 4,499,613, Cl. 3-31.000.
Yasuda, Hiromu: *See*—
Kuroda, Shigeaki; Senshu, Takao; Oguni, Kensaku; Mochizuki, Taketoshi; Yasuda, Hiromu; Ishibane, Kyuhei; Atsumi, Akira; Kimura, Hideyuki; and Hatada, Toshio, 4,500,035, Cl. 236-92.00B.
Yasui, Kazuomi: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, 4,500,342, Cl. 71-93.000.
Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; and Kamochi, Atsumi, 4,500,346, Cl. 71-94.000.
Yates, Gregory S.: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
Yatsuo, Tsutomu; Nagano, Takahiro; Oikawa, Saburo; and Horie, Akira, to Hitachi, Ltd. Semiconductor GTO switching device with radially elongated cathode emitter regions of increasing length. 4,500,903, Cl. 357-38.000.
Yazaki, Takao; Hattori, Kazuhide; Hattori, Satoru; Hayama, Kazuhide; and Itoh, Isao, to Mitsubishi Petrochemical Co., Ltd.; and Mitsubishi Yuka Fine Chemicals Co., Ltd. Composite heat-insulating material and process for the production thereof. 4,500,597, Cl. 428-317.700.

Yazawa, Hiromi: *See*—
Shiba, Keisuke; Yazawa, Hiromi; Ohishi, Chikashi; and Nakao, Sho, 4,500,618, Cl. 430-49.000.
Yazawa, Hiroshi: *See*—
Okada, Tokio; Tani, Haruhisa; Kojima, Shigezo; Tsuyama, Setsuya; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,499,639, Cl. 28-282.000.
Yeagley, Henry L. Organic waste bioconverter and method. 4,499,614, Cl. 4-111.100.
Yeh, Pochi A., to Rockwell International Corporation. Iso-index birefringent filters. 4,500,178, Cl. 350-404.000.
Yemoto, Jiichiro; Tarao, Ryokichi; and Yamamoto, Yoshio, to Chisso Corporation. Silane derivative and fragrant article. 4,500,725, Cl. 556-482.000.
Yeowell, David A.: *See*—
Wisowaty, James C.; Swaringen, Roy A.; and Yeowell, David A., 4,500,711, Cl. 544-258.000.
Yerman, Alexander J., to General Electric Company. Electrical assembly including a conductor pattern bonded to a non-metallic substrate and method of fabricating such assembly. 4,500,029, Cl. 228-123.000.
Yeterian, Vahan H.: *See*—
Cole, Eugene O.; and Yeterian, Vahan H., 4,500,206, Cl. 356-376.000.
Yoder, Clarence T. Travel trailer frame support. 4,500,132, Cl. 296-171.000.
Yokota, Takashi: *See*—
Tomita, Satoru; Shimura, Akira; and Yokota, Takashi, 4,499,849, Cl. 118-652.000.
Yokoyama, Kunio: *See*—
Motoyama, Takeshi; Onishi, Toshiyuki; and Yokoyama, Kunio, 4,499,738, Cl. 62-155.000.
Yonekawa, Hitoshi: *See*—
Ishii, Kiyoshi; Murai, Masataka; and Yonekawa, Hitoshi, 4,500,426, Cl. 210-321.300.
Yoshida, Hiroshi; Koike, Kengo; Shimano, Shizuo; Nakagawa, Taizo; and Ohmori, Kaoru, to Nippon Kayaku Kabushiki Kaisha. Derivatives of N,N'-substituted azolecarboxamide and agricultural and horticultural fungicidal or nematicidal composition containing same as active ingredients. 4,500,536, Cl. 514-397.000.
Yoshida, Kazumasa: *See*—
Nagamine, Akio; Hayashi, Akira; Yoshida, Kazumasa; and Miyasaka, Kojiro, 4,500,614, Cl. 429-206.000.
Yoshida, Tadao, to Sony Corporation. Servo circuit for a motor for reproducing a PCM audio disk. 4,500,982, Cl. 369-50.000.
Yoshida, Tomomasa: *See*—
Tsuchiya, Masatoshi; Soeno, Ko; and Yoshida, Tomomasa, 4,499,774, Cl. 73-727.000.
Yoshida, Yasuharu; Sceguchi, Hiroshi; and Tagashira, Yoshimi, to Nippon Electric Co., Ltd. Device for eliminating FM or like interference from a digital microwave signal. 4,501,004, Cl. 375-102.000.
Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,500,983, Cl. 369-77.200.
Yoshihara, Takahisa: *See*—
Komoda, Akira; Hirooka, Yasuhiro; Yoshihara, Takahisa; and Matsuda, Akira, 4,500,400, Cl. 204-206.000.
Yoshimaru, Tomohisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Data-recording apparatus. 4,500,926, Cl. 358-256.000.
Yoshimura, Eiji: *See*—
Mitomi, Takeshi; Yoshimura, Eiji; and Komagata, Hideki, 4,500,581, Cl. 428-85.000.
Yoshizumi, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Resistor-type disconnecting switch for circuit breaker. 4,500,762, Cl. 200-144.0AP.
Youle, Richard J.: *See*—
Neville, David M., Jr.; and Youle, Richard J., 4,500,637, Cl. 435-2.000.
Young, David E., to Protectair Limited. Urethral catheter. 4,500,313, Cl. 604-280.000.
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G. Adherent controlled release microbiocides containing hydrolyzable silanes and organic titanium compounds. 4,500,337, Cl. 71-67.000.
Young, Robert W.; Prussin, Samuel, deceased (by Prussin, Shirley, executor); and Gaylord, Norman G. Adherent controlled release microbiocides containing hydrolyzable organic titanium compounds. 4,500,338, Cl. 71-67.000.
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G. Adherent controlled release microbiocides containing hydrolyzable silanes. 4,500,339, Cl. 71-67.000.
Young, William E.: *See*—
Hamm, James R.; and Young, William E., 4,499,722, Cl. 60-39.120.
Yuhara, Akitsuna; Hosaka, Norio; Fujita, Yuji; Kishimoto, Kiyoharu; and Yamada, Jun, to Hitachi, Ltd. Surface acoustic wave transmission device for a low frequency signal below 30 MHz. 4,500,807, Cl. 310-313.00B.
Zagranski, Raymond D.; Howlett, James J.; and Lappos, Nicholas D., to United Technologies Corporation. Super contingency aircraft engine control. 4,500,966, Cl. 364-432.000.
Zaita, Katsuyuki; and Tahata, Michio, to Honda Giken Kogyo Kabushiki Kaisha. Sliding throttle valve type carburetor. 4,500,477, Cl. 261-44.00B.
Zapisek, Stephen: *See*—
D'Agostino, Vincent F.; Lee, Joseph Y.; Zapisek, Stephen; and Schore, George, 4,500,396, Cl. 204-107.000.
Zaromb, Solomon. Power generation apparatus and methods. 4,499,734, Cl. 60-673.000.
Zaugg, Robert; and Keller, Werner, to Stopinc Aktiengesellschaft. Rotary sliding closure unit and liquid melt container employing the same. 4,500,018, Cl. 222-598.000.
Zbinden, Paul: *See*—
Habicht, Ernst; and Zbinden, Paul, 4,500,542, Cl. 514-465.000.
Zehntel, Inc.: *See*—
Jacobson, Robert G., 4,500,993, Cl. 371-16.000.
Zeitlin, Martin A.: *See*—
Petty-Weeks, Bruce C.; and Zeitlin, Martin A., 4,500,732, Cl. 562-486.000.
Zeitraeg, Rolf, to Siemens Aktiengesellschaft. Method for conversion of linearly encoded into non-linearly encoded digital signals. 4,500,869, Cl. 340-347.0DD.
Zellweger Uster Ltd.: *See*—
Aeppli, Kurt, 4,500,792, Cl. 250-560.000.
Zimmardi, Francesco P. Jewelry clasp. 4,499,634, Cl. 24-116.00A.
Zimmerly, Harry L., to Halkey-Roberts Corporation. Bore lubricator. 4,499,968, Cl. 184-18.000.
Zimmerly, Harry L., to Halkey-Roberts Corp. Multiple firing inflator. 4,500,014, Cl. 222-5.000.
Ziolkowski, Antoni M.; and Lerwill, William E., to Seismograph Service Corporation. Seismographic method and apparatus using scaled sound sources. 4,500,978, Cl. 367-142.000.
Zislis, Paul M.: *See*—
Babecki, Glenn R.; Escolar, Carlos; Garnant, Craig M.; Kan, Hsin-Kuo; Kaplan, Frank; Liu, Hueichi R.; MacLachlan, George F.; Matteo, Peter J.; McDonald, John F.; Palframan, John D.; Tran, Roger T.; Welt, Martin J.; Wendt, Timothy A.; Yates, Gregory S.; and Zislis, Paul M., 4,500,960, Cl. 364-200.000.
Zoecon Corporation: *See*—
Henrick, Clive A., 4,500,737, Cl. 568-329.000.
Zsoka, Istvan; Madar, Laszlo ; Cubin, Anatoly A.; Gaivoronsky, Albert A.; Farukshin, Lev H.; Morzsic, Piotr A.; Lisov, Aleksandr I.; and Galusztainc, Vladilen A., to Magyar Szenhidrogenipari Kutatofejleszto Intezet; and Vsesojuzny Nauchno-Issledovatelsky Institut Burovoi Technici. Packer for separation of zones in a well bore. 4,499,947, Cl. 166-179.000.
Zukausky, Keith E., to Eaton Corporation. Pilot operated low flow valve. 4,500,067, Cl. 251-38.000.
Zumfeld, Heinz: *See*—
Chardon, Manfred; Mauries, Reinhard; Rohner, Joachim; and Zumfeld, Heinz, 4,499,715, Cl. 57-22.000.
Zwick, Stanley A.; and Ackerman, John P., to United States of America, Energy. Method of fabricating a monolithic core for a solid oxide fuel cell. 4,499,663, Cl. 29-623.100.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF FEBRUARY, 1985

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Arthur D. Little, Inc.: *See*—
Loeffler, Herbert H.; and Tishler, Samuel W., Re. 31,833, Cl. 99-332.000.

Efamol Limited: *See*—
Horrobin, David F., Re. 31,836, Cl. 514-474.000.

Horrobin, David F., to Efamol Limited. Pharmaceutical and dietary composition. Re. 31,836, Cl. 514-474.000.

Loeffler, Herbert H.; and Tishler, Samuel W., to Arthur D. Little, Inc. Food cooking apparatus. Re. 31,833, Cl. 99-332.000.

Manetta, Peter J. Accumulating lift and carry conveyor. Re. 31,834, Cl. 198-751.000.

Rannenberg, George C., to United Technologies Corporation. Pneumatic supply system having variable geometry compressor. Re. 31,835, Cl. 417-282.000.

Tishler, Samuel W.: *See*—
Loeffler, Herbert H.; and Tishler, Samuel W., Re. 31,833, Cl. 99-332.000.

United Technologies Corporation: *See*—
Rannenberg, George C., Re. 31,835, Cl. 417-282.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Albany International Corp.: *See*—
Lopatin, George; Coplan, Myron J.; and Walton, James P., Jr., B1 4,342,811, Cl. 428-220.000.

Braddick, Britt O.; and Lindsey, Hiram E., to Texas Iron Works, Inc. Method for positioning a liner on a tubular member in a well bore with a retrievable pack off bushing therebetween. B1 3,920,075, 2-19-85, Cl. 166-290.000.

Braddick, Britt O.; and Lindsey, Hiram E., to Texas Iron Works, Inc. Apparatus for positioning a liner on a tubular member in a well bore with a retrievable pack off bushing therebetween. B1 4,281,711, 2-19-85, Cl. 166-118.000.

Coplan, Myron J.: *See*—
Lopatin, George; Coplan, Myron J.; and Walton, James P., Jr., B1 4,342,811, Cl. 428-220.000.

Dahlstrom, Baesley I.: *See*—
Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., B1 4,194,685, Cl. 235-375.000.

Dynetics Engineering Corp.: *See*—
Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., B1 4,194,685, Cl. 235-375.000.

Fisher, Robert D.: *See*—
Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., B1 4,194,685, Cl. 235-375.000.

Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., to Dynetics Engineering Corp. Verifying insertion system apparatus and method of operation. B1 4,194,685, 2-19-85, Cl. 235-375.000.

Lindsey, Hiram E.: *See*—
Braddick, Britt O.; and Lindsey, Hiram E., B1 3,920,075, Cl. 166-290.000.
Braddick, Britt O.; and Lindsey, Hiram E., B1 4,281,711, Cl. 166-118.000.

Lopatin, George; Coplan, Myron J.; and Walton, James P., Jr., to Albany International Corp. Open-celled microporous sorbent-loaded textile fibers and films and methods of fabricating same. B1 4,342,811, 2-19-85, Cl. 428-220.000.

Texas Iron Works, Inc.: *See*—
Braddick, Britt O.; and Lindsey, Hiram E., B1 3,920,075, Cl. 166-290.000.
Braddick, Britt O.; and Lindsey, Hiram E., B1 4,281,711, Cl. 166-118.000.

Walton, James P., Jr.: *See*—
Lopatin, George; Coplan, Myron J.; and Walton, James P., Jr., B1 4,342,811, Cl. 428-220.000.

LIST OF DESIGN PATENTEES

Albanese, Anthony F., to I.P.F. International, Inc. Chair. 277,621, 2-19-85, Cl. D6-334.000.

Amano, Kazunori: *See*—
Kojima, Nobuyuki; Sekigawa, Youichi; and Amano, Kazunori, 277,697, Cl. D23-121.000.

American Tourister, Inc.: *See*—
Bomes, Harvey J.; Migliore, John J.; Pulichino, John; and Barber, Jack, 277,618, Cl. D3-71.000.
Bomes, Harvey J.; Migliore, John J.; Pulichino, John; and Barber, Jack, 277,619, Cl. D3-71.000.

Apple Computer, Inc.: *See*—
Dresselhaus, William F.; Campbell, Kenneth S.; Twyman, Clive R.; and Dayton, Douglas C., 277,673, Cl. D14-106.000.

Aqua-Leisure Industries, Inc.: *See*—
Fireman, Simon C., 277,614, Cl. D2-234.000.

AT&T Bell Laboratories: *See*—
Genaro, Donald M.; Gotway, Jerome M.; Hall, Norris R.; and McGarvey, John N., 277,665, Cl. D14-60.000.

AT&T Information Systems Inc.: *See*—
Bhat, Ghanshyam A.; Chan, Eric P. P.; Lamancusa, John S.; Sylvester, Gordon E.; and Varela, Jose R., 277,666, Cl. D14-63.000.

AT&T Technologies, Inc.: *See*—
Wilt, William L., 277,664, Cl. D14-60.000.

Avery, Ronald G.: *See*—
Kahl, William G., Jr.; and Avery, Ronald G., 277,652, Cl. D10-106.000.

Barber, Jack: *See*—
Bomes, Harvey J.; Migliore, John J.; Pulichino, John; and Barber, Jack, 277,618, Cl. D3-71.000.
Bomes, Harvey J.; Migliore, John J.; Pulichino, John; and Barber, Jack, 277,619, Cl. D3-71.000.

Baume & Mercier S.A.: *See*—
Glauser, Alain, 277,649, Cl. D10-32.000.

Becker, James H., to Marketing International, Inc. Cart for handling biological tissue. 277,708, 2-19-85, Cl. D34-20.000.

Bello, Paul A. Pet food dish holder. 277,705, 2-19-85, Cl. D30-16.000.

Bhat, Ghanshyam A.; Chan, Eric P. P.; Lamancusa, John S.; Sylvester, Gordon E.; and Varela, Jose R., to AT&T Information Systems Inc. Housing for a telephone station handset. 277,666, 2-19-85, Cl. D14-63.000.

Black & Decker Inc.: *See*—
Somers, Robert I., 277,638, Cl. D8-62.000.

Blodee, Leif, to Riblet Products Corporation. Combined tub and shower stall. 277,695, 2-19-85, Cl. D23-49.000.

Blome, Fred C. Document holder. 277,631, 2-19-85, Cl. D6-311.000.

Bomes, Harvey J.; Migliore, John J.; Pulichino, John; and Barber, Jack, to American Tourister, Inc. Carry-on luggage. 277,618, 2-19-85, Cl. D3-71.000.
Bomes, Harvey J.; Migliore, John J.; Pulichino, John; and Barber, Jack, to American Tourister, Inc. Portfolio case. 277,619, 2-19-85, Cl. D3-71.000.
Bourque, Rene, to Warrington Inc. Goaler skate. 277,693, 2-19-85, Cl. D21-225.000.
Brown, Jeffrey C., to John Fluke Mfg. Co., Inc. Electronic instrument for logging data. 277,670, 2-19-85, Cl. D14-100.000.
Bulgari, Marina, to Marina B. Creation S.A. Ashtray with fish-like pattern. 277,702, 2-19-85, Cl. D27-23.000.
B.V. Machine-en Metaalwarenfabriek "Dremefa": *See*—
Drexler, Joannes H., 277,640, Cl. D8-88.000.
Cafaro, John A.; and Palmer, Jerry P., to General Motors Corporation. Vehicle wheel. 277,661, 2-19-85, Cl. D12-211.000.
Campbell, Kenneth S.: *See*—
Dresselhaus, William F.; Campbell, Kenneth S.; Twyman, Clive R.; and Dayton, Douglas C., 277,673, Cl. D14-106.000.
Cerberus AG: *See*—
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CLASS 56

11.9 4,499,710
13.6 4,499,711
16.4 4,499,712
160 4,500,726
328 R 4,499,713
341 4,499,714

CLASS 57

22 4,499,715
234 4,499,716
297 4,499,717
301 4,499,718
417 4,499,719

CLASS 59

78.1 4,499,720

CLASS 60

39.05 4,499,721
39.12 4,499,722
211 4,499,723
290 4,499,724
506 4,499,725
517 4,499,726
525 4,499,727
570 4,499,728
578 4,499,729
585 4,499,730
602 4,499,731
4,499,732
611 4,499,733
673 4,499,734
739 4,499,735

CLASS 62

3 4,499,736
17 4,500,333
56 4,499,737
155 4,499,738
212 4,499,739
374 4,499,740

CLASS 65

334 4,500,334

CLASS 66

171 4,499,741
172 E 4,499,742

CLASS 68

18 C 4,499,743
210 4,499,744

CLASS 70

285 4,499,745

CLASS 71

28 4,500,335
29 4,500,336
67 4,500,337
4,500,338
4,500,339
76 4,500,343
90 4,500,340
92 4,500,341
93 4,500,342
4,500,344
4,500,345
94 4,500,346
97 4,500,347
103 4,500,348

CLASS 72

13 4,499,746
238 4,499,748
325 4,499,749
351 4,499,750

CLASS 73

4 R 4,499,751
40.7 4,499,752
59 4,499,753
116 4,499,755
118 4,499,756
119 A 4,499,757
146 4,499,759
159 4,499,758
4,499,760
170 A 4,499,762
170 R 4,499,761
4,499,763
253 4,499,764
290 V 4,499,765
304 C 4,499,766
4,499,767
462 4,499,768
587 4,499,769
599 4,499,770
632 4,499,771
666 4,499,772
718 4,499,773
727 4,499,774
861.12 4,499,754
862.57 4,499,775
863.85 4,499,776
864.56 4,499,777

CLASS 74

5 F 4,499,778
61 4,499,779
107 4,499,780
193 4,499,781
200 4,499,782
411 4,499,783
479 4,499,784
501 R 4,499,785
606 R 4,499,786
625 4,499,787
661 4,499,788
665 C 4,499,790
700 4,499,791
740 4,499,789
825 4,499,792
866 4,499,793

CLASS 75

0.5 B 4,500,349
1 R 4,500,350
128 N 4,500,351
130 B 4,500,352
252 4,500,353

CLASS 76

75 4,499,794
108 A 4,499,795

CLASS 81

5.1 R 4,499,796
367 4,499,797
423 4,499,798
446 4,499,799

CLASS 82

36 R 4,499,800

CLASS 83

24 4,499,801
117 4,499,802
319 4,499,803
399 4,499,804
468 4,499,805
527 4,499,806

CLASS 84

1.03 4,499,807
4,499,808
1.15 4,499,809
1.24 4,500,317
384 4,499,810

CLASS 89

14.5 4,499,811

CLASS 91

376 R 4,499,812

CLASS 92

31 4,499,813
169 4,499,814

CLASS 98

40.14 4,499,815
40.26 4,499,816

CLASS 99

332 Re.31,833
403 4,499,817
483 4,499,818
4,499,819
646 S 4,499,820

CLASS 100

48 4,499,824
51 4,499,821
117 4,499,822
121 4,499,823

CLASS 101

152 4,499,831
167 4,499,825
181 4,499,826
425 4,499,827

CLASS 102

301 4,499,828
378 4,499,829
476 4,499,830

CLASS 106

21 4,500,354
22 4,500,355
90 4,500,356
4,500,357
122 4,500,358
270 4,500,359
286.5 4,500,360
298 4,500,361
309 4,500,362

CLASS 110

238 4,499,832
342 4,499,833

CLASS 112

2 4,499,834
79 R 4,499,835
158 A 4,499,837
158 E 4,499,836
266.1 4,499,838
317 4,499,839

CLASS 114

51 4,499,840
98 4,499,841
103 4,499,842
280 4,499,843
367 4,499,844

CLASS 116

137 A 4,499,845
272 4,499,846

CLASS 118

19 4,499,847
45 4,499,848
406 4,499,850
652 4,499,849
658 4,499,851
690 4,499,852
725 4,499,853

CLASS 119

14.32 4,499,854
29 4,499,855
82 4,499,856

CLASS 122

4 D 4,499,857
14 4,499,858
18 4,499,859
510 4,499,860

CLASS 123

1 A 4,499,861
4,499,862
3 4,499,863
4,499,864
41.05 4,499,865
41.21 4,499,866
145 A 4,499,867
188 M 4,499,868
195 C 4,499,869
198 F 4,499,870
276 4,499,871
344 4,499,872
372 4,499,873
407 4,499,874
416 4,499,875
425 4,499,877
446 4,499,876
478 4,499,878
480 4,499,879
489 4,499,880
492 4,499,881
4,499,882
503 4,499,883
506 4,499,884
525 4,499,885
557 4,499,886
575 4,499,887
615 4,499,888

CLASS 126

75 4,499,889
116 R 4,499,890
247 4,499,913
292 4,499,891
446 4,499,892
449 4,499,893
450 4,499,894

CLASS 128

6 4,499,895
156 4,499,896
303.1 4,499,897
305 4,499,898
4,499,899
423 W 4,499,900
635 4,499,901
660 4,499,902
675 4,499,903
703 4,499,904
727 4,499,905
776 4,499,906
786 4,499,907

CLASS 130

27 K 4,499,908

CLASS 131

84 R 4,499,909
95 4,499,910
302 4,499,911
336 4,499,912

CLASS 134

10 4,500,363

CLASS 136

206 4,500,741
4,500,742
258 4,500,743
4,500,744

CLASS 137

81.1 4,499,914
85 4,499,915
103 4,499,916
341 4,499,917
606 4,499,918
613 4,499,919
624.15 4,499,920
625.24 4,499,922
627.5 4,499,921

CLASS 138

109 4,499,923
110 4,499,924
125 4,499,925
126 4,499,926

CLASS 139

425 A 4,499,927

CLASS 140

93.2 4,499,928

CLASS 141

1.1 4,499,929
8 4,499,930
67 4,499,931
91 4,499,932

CLASS 144

134 A 4,499,933
176 4,499,934
209 R 4,499,935

CLASS 145

33 E 4,499,936

CLASS 148

1.5 4,500,365
6.14 R 4,500,364
111 4,500,366
171 4,500,367
431 4,500,368

CLASS 149

2 4,500,369
109.6 4,500,370

CLASS 156

48 4,500,371
73.3 4,500,372
79 4,500,373
83 4,500,374
96 4,500,375
159 4,500,376
160 4,500,378
164 4,500,377
172 4,500,379
197 4,500,380
205 4,500,381
272.8 4,500,382
285 4,500,383
290 4,500,384
380.4 4,500,385
449 4,500,386
499 4,500,387
603 4,500,388
643 4,500,389

CLASS 159

6.1 4,500,390

CLASS 160

41 4,499,937
236 4,499,938

CLASS 164

23 4,499,939
36 4,499,940
313 4,499,941

CLASS 165

78 4,499,942
95 4,499,943
104.16 4,499,944

CLASS 166

50 4,499,945
57 4,499,946
118 B1 4,281,711
179 4,499,947
248 4,499,948
260 4,499,949
285 4,499,950
290 B1 3,920,075
297 4,499,951

CLASS 169

61 4,499,952

CLASS 172

68 4,499,747

CLASS 173

43 4,499,953

CLASS 174

31 R 4,500,745
48 4,500,746
76 4,500,747
121 A 4,500,748

CLASS 175

21 4,499,954
46 4,499,955
4,499,956
71 4,499,957
329 4,499,958
330 4,499,959

CLASS 177

25 4,499,960
4,499,961
58 4,499,962

CLASS 178

18 4,500,749
22.08 4,500,750

CLASS 179

2 DP 4,500,751
2 EA 4,500,752
6.03 4,500,753
81 R 4,500,754
170 NC 4,500,755

CLASS 180

90.6 4,499,963
142 4,499,964
165 4,499,965

CLASS 182

3 4,499,966
222 4,499,967

CLASS 184

18 4,499,968
106 4,499,969

CLASS 187

9 R 4,499,970
4,499,971
29 4,499,973
29 R 4,499,972
4,499,974
4,499,975

CLASS 188

71.9 4,499,976
72.6 4,499,977
79.5 K 4,499,978

CLASS 192

3.31 4,499,979
35 4,499,980
106.2 4,499,981

CLASS 194

1 G 4,499,983
1 N 4,499,982
4 C 4,499,984
10 4,499,985

CLASS 198

322 4,499,986
347 4,499,987
369 4,499,988
407 4,499,989
411 4,499,990
472 4,499,991
498 4,499,992
751 Re.31,834
819 4,499,993

CLASS 200

5 A 4,500,756
4,500,757
4,500,758
81.9 R 4,500,759
83 C 4,500,760
84 C 4,500,761
144 AP 4,500,762

CLASS 204

1 T 4,500,391
5 4,500,392
4,500,393
15 4,500,394
107 4,500,396
117 4,500,398
181 C 4,500,399
181 T 4,500,397
206 4,500,400
225 4,500,401
242 4,500,402
255 4,500,403
266 4,500,404
284 4,500,395
290 F 4,500,405
293 4,500,406
298 4,500,407
4,500,408
4,500,409
299 R 4,500,410
413 4,500,411
425 4,500,412
435 4,500,413

CLASS 206

45.19 4,499,994
312 4,499,995
444 4,499,996
509 4,499,997
541 4,499,998
546 4,499,999
554 4,500,000
597 4,500,001

CLASS 208

11 R 4,500,414
56 4,500,415
86 4,500,416
111 4,500,417
114 4,500,418
115 4,500,419
116 4,500,420
4,500,421
117 4,500,422
161 4,500,423
216 PP 4,500,424

CLASS 209

534 4,500,002
573 4,500,003

CLASS 210

136 4,500,425
321.3 4,500,426
608 4,500,427
609 4,500,428
616 4,500,429
638 4,500,430
656 4,500,431
659 4,500,432
669 4,500,433
696 4,500,434
798 4,500,435

CLASS 212

80 4,500,004

CLASS 215

203 4,500,005
224 4,500,006

CLASS 219

58 4,500,763
59.1 4,500,764
73.21 4,500,765
76.1 4,500,766
78.01 4,500,767
86.25 4,500,768
86.33 4,500,769
121 LH 4,500,771
121 LK 4,500,770
209 4,500,772
215 4,500,773
265 4,500,774
497 4,500,775

CLASS 220

71 4,500,007
242 4,500,008
256 4,500,009
320 4,500,010
359 4,500,011

CLASS 221

173 4,500,012
285 4,500,013

CLASS 222

5 4,500,014
83.5 4,500,015
153 4,500,016
288 4,500,017
598 4,500,018

CLASS 224

222 4,500,019
321 4,500,020

CLASS 225

49 4,500,021
97 4,500,022

CLASS 226

76 4,500,023

CLASS 227

19 4,500,024
4,500,025

CLASS 228

44.1 R 4,500,026
54 4,500,027
117 4,500,028
123 4,500,029
125 4,500,030
179 4,500,031
180 A 4,500,032
219 4,500,033

CLASS 235

162 4,500,776
375 B1 4,194,685
487 4,500,777

CLASS 236

49 4,500,034
68 B 4,500,036
92 B 4,500,035

CLASS 238

2 4,500,037

CLASS 239

85 4,500,038
193 4,500,039

CLASS 241

14 4,500,040
16 4,500,041
238 4,500,042

CLASS 242

45 4,500,043
56 A 4,500,044
57.1 4,500,045
67.1 R 4,500,046
71.9 4,500,047
107.3 4,500,048
186 4,500,049
198 4,500,050

CLASS 244

3.16 4,500,051
12.1 4,500,052
54 4,500,053
4,500,054
55 4,500,055
137 R 4,500,056
161 4,500,057

CLASS 246

3 4,500,058

CLASS 248

205.1 4,500,059
349 4,500,060
359 I 4,500,061
371 4,500,062
475.1 4,500,063
539 4,500,064
542 4,500,065

CLASS 250

204 4,500,778
231 SE 4,500,779
4,500,780
269 4,500,781
291 4,500,782
327.2 4,500,783
341 4,500,784
385 4,500,785
389 4,500,786
427 4,500,787
455.1 4,500,788
492.2 4,500,789
4,500,790
493.1 4,500,791
560 4,500,792
574 4,500,793

CLASS 251

26 4,500,066
38 4,500,067
205 4,500,068
282 4,500,069
4,500,070

CLASS 252

8.5 A 4,500,436
8.55 C 4,500,437
8.75 4,500,438
46.4 4,500,439
51.5 A 4,500,440
58 4,500,678
89.1 4,500,441
182 4,500,442
301.4 P 4,500,443
315.7 4,500,444
387 4,500,445
403 4,500,446
511 4,500,447
522 R 4,500,448
628 4,500,449

CLASS 254

95 4,500,072
258 4,500,073
270 4,500,074
423 4,500,071

CLASS 260

112 R 4,500,450
4,500,451
112.5 R 4,500,452
117 4,500,453
123.5 4,500,454
239 A 4,500,456
245.2 R 4,500,457
245.5 4,500,472
351.5 4,500,458
396 N 4,500,459
397.2 4,500,460
397.45 4,500,461
405.5 4,500,462
406 4,500,463
413 4,500,464
429 R 4,500,465
429.9 4,500,466
465.8 D 4,500,468
502.5 E 4,500,469
4,500,470
544 D 4,500,471
548 4,500,473
549 4,500,474

CLASS 261

36 A 4,500,475
44 B 4,500,477
44 C 4,500,476
52 4,500,478
98 4,500,479
104 4,500,480

CLASS 264

40.6 4,500,481
65 4,500,482
81 4,500,483
107 4,500,484
313 4,500,485
335 4,500,486

CLASS 267

8 R 4,500,075
4,500,076

CLASS 269

45 4,500,077
46 4,500,078
47 4,500,079
56 4,500,080
93 4,500,081

CLASS 270

20.1 4,500,082
54 4,500,083

CLASS 271

35 4,500,084
207 4,500,085
225 4,500,086
293 4,500,087

CLASS 272

8 M 4,500,088
117 4,500,089

CLASS 273

153 S 4,500,090
269 4,500,091

CLASS 277

12 4,500,092
15 4,500,093
31 4,500,094
34 4,500,095
53 4,500,096
59 4,500,097
170 4,500,098
228 4,500,099
235 B 4,500,100

CLASS 280

152.1 4,500,101
242 WC 4,500,102
281 R 4,500,103
289 D 4,500,104
468 4,500,105
605 4,500,106
4,500,107
614 4,500,108
650 4,500,109
680 4,500,110
688 4,500,111
693 4,500,112
716 4,500,113
742 4,500,114
808 4,500,115

CLASS 283

92 4,500,116

CLASS 285

3 4,500,117
247 4,500,118
276 4,500,119

CLASS 290

38 C 4,500,794

CLASS 292

19 4,500,120
79 4,500,121
161 4,500,122
259 A 4,500,123
318 4,500,124

CLASS 294

1 BA 4,500,125
86 R 4,500,126
104 4,500,127
146 4,500,128
172 4,500,129

CLASS 296

65 R 4,500,130
97 K 4,500,131
171 4,500,132

CLASS 297

131 4,500,133
170 4,500,134
250 4,500,135
284 4,500,136
458 4,500,137

CLASS 303

6 C 4,500,138

CLASS 305

10 4,500,139

CLASS 307

141 4,500,795
147 4,500,796
296 R 4,500,797
317 R 4,500,798
449 4,500,799
468 4,500,800
570 4,500,801
571 4,500,802

CLASS 308

3.8 4,500,140
4 R 4,500,141
10 4,500,142

CLASS 310

11 4,500,803
40 MM 4,500,804
80 4,500,805
198 4,500,806
313 B 4,500,807

CLASS 312

61 4,500,145
257 SM 4,500,146
291 4,500,147
312 4,500,148

CLASS 313

409 4,500,808
444 4,500,809
486 4,500,810

CLASS 315

58 4,500,811
171 4,500,812
276 4,500,813
323 4,500,814
366 4,500,815
368 4,500,816

CLASS 318

7 4,500,817
52 4,500,818
106 4,500,819
139 4,500,820
254 4,500,821
314 4,500,822
632 4,500,823
701 4,500,824
792 4,500,825
820 4,500,826

CLASS 322

3 4,500,827
46 4,500,828

CLASS 323

215 4,500,829
267 4,500,830
315 4,500,831
340 4,500,832
359 4,500,833

CLASS 324

52 4,500,834
58.5 R 4,500,835
73 AT 4,500,836
102 4,500,837
117 R 4,500,838
204 4,500,839
425 4,500,840

CLASS 328

146 4,500,841
150 4,500,842

CLASS 330

4.3 4,500,843
10 4,500,844
86 4,500,845
253 4,500,846
277 4,500,847
285 4,500,848
300 4,500,849
307 4,500,850

CLASS 331

2 4,500,851
12 4,500,852
18 4,500,853
117 R 4,500,854

CLASS 332

7.51 4,500,855
9 R 4,500,856
4,500,857

CLASS 333

202 4,500,858
208 4,500,859

CLASS 335

216 4,500,860
253 4,500,861

CLASS 337

32 4,500,862
70 4,500,863

CLASS 338

4 4,500,864
13 4,500,865
126 4,500,866
128 4,500,867

CLASS 339

17 C 4,500,149
28 4,500,150
59 R 4,500,151
61 M 4,500,152
89 M 4,500,153
4,500,154
94 C 4,500,156
94 M 4,500,155
97 R 4,500,157
122 R 4,500,158
147 R 4,500,159
166 R 4,500,160
242 4,500,161
252 F 4,500,162

CLASS 340

52 F 4,500,868
347 DD 4,500,869
4,500,871
347 P 4,500,870
365 R 4,500,872
515 4,500,873
607 4,500,874
703 4,500,875
709 4,500,876
711 4,500,877
713 4,500,878
739 4,500,879
825.35 4,500,880
825.73 4,500,881

CLASS 343

372 4,500,882
383 4,500,883
456 4,500,884
4,500,885
4,500,886
700 MS 4,500,887
873 4,500,888

CLASS 346

1.1 4,500,889

29 4,500,890
76 PH 4,500,891
4,500,892
4,500,893
140 R 4,500,894
4,500,895
204 4,500,896
209 4,500,897

CLASS 350

3.7 4,500,163
96.10 4,500,164
96.20 4,500,165
4,500,166
96.32 4,500,167
96.34 4,500,168
288 4,500,169
320 4,500,171
331 R 4,500,172
345 4,500,173
357 4,500,174
358 4,500,175
376 4,500,176
4,500,177
404 4,500,178
574 4,500,181
611 4,500,170

CLASS 351

137 4,500,179
234 4,500,180

CLASS 354

4 4,500,182
21 4,500,183
149.11 4,500,184
209 4,500,185
234 4,500,186
266 4,500,187
406 4,500,188
407 4,500,189
416 4,500,190
418 4,500,191
427 4,500,192
471 4,500,193

CLASS 355

3 DD 4,500,194
4,500,196
3 R 4,500,195
8 4,500,197
14 CU 4,500,199
14 D 4,500,198

CLASS 356

152 4,500,200
4,500,201
237 4,500,202
240 4,500,203
318 4,500,204
325 4,500,205
376 4,500,206
409 4,500,207
431 4,500,208

CLASS 357

23 4,500,898
4,500,899
36 4,500,900
38 4,500,901
4,500,902
4,500,903
67 4,500,904
68 4,500,905
71 4,500,906
79 4,500,907

CLASS 358

11 4,500,908
17 4,500,909
28 4,500,910
31 4,500,912
36 4,500,911
44 4,500,913
4,500,914
4,500,915
51 4,500,916
75 4,500,917
4,500,918
78 4,500,919
139 4,500,920
174 4,500,921
188 4,500,922
190 4,500,923
213 4,500,924
227 4,500,925
256 4,500,926
293 4,500,927
296 4,500,928
299 4,500,929
310 4,500,930
4,500,931

CLASS 360

65 4,500,932
69 4,500,933

CLASS 361

3 4,500,934
56 4,499,673
152 4,500,936
153 4,500,937
4,500,938
221 4,500,939
286 4,500,940
293 4,500,941
320 4,500,942
333 4,500,935
383 4,500,943
384 4,500,944
386 4,500,945

CLASS 362

226 4,500,946
311 4,500,947
382 4,500,948

CLASS 363

28 4,500,949

CLASS 364

138 4,500,950
186 4,500,951
200 4,500,952
4,500,953
4,500,954
4,500,955
4,500,956
4,500,957
4,500,958
4,500,959
4,500,960
4,500,961
4,500,962
300 4,500,963
4,500,964
400 4,500,965
432 4,500,966
434 4,500,967
471 4,500,968
508 4,500,969
513 4,500,970
513.5 4,500,971
526 4,500,972
606 4,500,973

CLASS 365

104 4,500,975
222 4,500,974

CLASS 366

157 4,500,209
207 4,500,210

CLASS 367

48 4,500,976
108 4,500,977
142 4,500,978
149 4,500,979
154 4,500,980

CLASS 368

63 4,500,211
108 4,500,212
208 4,500,213

CLASS 369

43 4,500,981
50 4,500,982
77.2 4,500,983

CLASS 370

6 4,500,984
14 4,500,985
58 4,500,986
60 4,500,987
85 4,500,988
4,500,989
4,500,990
88 4,500,991
100 4,500,992

CLASS 371

16 4,500,993
43 4,500,994

CLASS 372

3 4,500,995
19 4,500,996
58 4,500,997
61 4,500,998

CLASS 374

36 4,500,214

CLASS 375

16 4,500,999
25 4,501,000
30 4,501,001
86 4,501,002
94 4,501,003
102 4,501,004

CLASS 376

283 4,500,487
409 4,500,488

CLASS 377

2 4,501,008
20 4,501,005
45 4,501,006
60 4,501,007

CLASS 378

19 4,501,009
38 4,501,010
196 4,501,011

CLASS 381

43 4,501,012
86 4,501,013
94 4,501,014
103 4,501,015

CLASS 382

22 4,501,016

CLASS 384

319 4,500,215
463 4,500,144
467 4,500,143

CLASS 400

8 4,500,216
320 4,500,217
490 4,500,218
568 4,500,219

CLASS 401

53 4,500,220
82 4,500,221
209 4,500,222

CLASS 402

20 4,500,223

CLASS 403

13 4,500,226
343 4,500,224

CLASS 404

6 4,500,225

CLASS 405

128 4,500,227

CLASS 406

61 4,500,228
88 4,500,229
131 4,500,230
198 4,500,231

CLASS 408

153 4,500,232
182 4,500,233
206 4,500,234
238 4,500,235

CLASS 409

86 4,500,236

CLASS 411

11 4,500,237
30 4,500,238
65 4,500,239
103 4,500,240

CLASS 412

37 4,500,241

CLASS 414

24.5 4,500,242
50 4,500,243
92 4,500,244
108 4,500,245
414 4,500,246
416 4,500,247
459 4,500,248
534 4,500,249
695.5 4,500,250
719 4,500,251

CLASS 415

9 4,500,252
53 T 4,500,253
75 4,500,254
189 4,500,255
191 4,500,256

CLASS 416

32 4,500,257
97 R 4,500,258
122 4,500,259

CLASS 417

64 4,500,260
203 4,500,261
214 4,500,262
282 Re.31,835
360 4,500,263
395 4,500,264
417 4,500,265
474 4,500,266
552 4,500,267

CLASS 418

1 4,500,268
45 4,500,269
133 4,500,270

CLASS 420

445 4,500,489

CLASS 422

62 4,500,490
150 4,500,491
199 4,500,492

CLASS 423

10 4,500,493
24 4,500,494
53 4,500,495
55 4,500,496
89 4,500,497
100 4,500,498
139 4,500,499
224 4,500,500
239 4,500,501
321 R 4,500,502
329 4,500,503
345 4,500,504
416 4,500,505
474 4,500,506

CLASS 424

1.1 4,500,507
4,500,508
3 4,500,509
80 4,500,510
81 4,500,511
89 4,500,512
4,500,513
94 4,500,514
154 4,500,515
156 4,500,516
162 4,500,517

CLASS 425

67 4,500,271
78 4,500,272
143 4,500,273
185 4,500,274
192 R 4,500,275
297 4,500,276
387.1 4,500,277
445 4,500,278
511 4,500,284
548 4,500,279
569 4,500,280

CLASS 426

3 4,500,547
19 4,500,548
33 4,500,549
38 4,500,550
62 4,500,551
96 4,500,552
101 4,500,553
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479 4,500,555
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622 4,500,558
646 4,500,559

CLASS 427

8 4,500,560
25 4,500,561
27 4,500,562
38 4,500,563
39 4,500,564
4,500,565
115 4,500,566
255.3 4,500,567
294 4,500,568
304 4,500,569
345 4,500,570

CLASS 428

13 4,500,571
34 4,500,572
35 4,500,573
4,500,574
4,500,575
36 4,500,576
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43 4,500,579
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85 4,500,581
116 4,500,582
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145 4,500,584
152 4,500,585
174 4,500,586
204 4,500,587
212 4,500,588
213 4,500,589
220 B1 4,342,811
222 4,500,590
251 4,500,591
257 4,500,592
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284 4,500,594
294 4,500,595
317.5 4,500,596
317.7 4,500,597
331 4,500,598
336 4,500,599
391 4,500,600
403 4,500,601
408 4,500,602
409 4,500,603
414 4,500,604
469 4,500,605
480 4,500,606
511 4,500,607
522 4,500,608
610 4,500,609
624 4,500,610
686 4,500,611

CLASS 429

26 4,500,612
69 4,500,613
206 4,500,614

CLASS 430

30 4,500,615
45 4,500,616
49 4,500,617
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59 4,500,619
60 4,500,620
72 4,500,621
78 4,500,622
83 4,500,623
138 4,500,624
149 4,500,625
203 4,500,626
4,500,627
311 4,500,628
325 4,500,629
386 4,500,630
413 4,500,631
428 4,500,632
505 4,500,633
544 4,500,634
552 4,500,635
566 4,500,636

CLASS 431

3 4,500,281
184 4,500,282
328 4,500,283

CLASS 432

103 4,500,285
106 4,500,286
246 4,500,287

CLASS 433

40 4,500,288
54 4,500,289
4,500,290
173 4,500,292
213 4,500,291
215 4,500,294
225 4,500,296

CLASS 434

114 4,500,293
218 4,500,295

CLASS 435

2 4,500,637
235 4,500,638
244 4,500,639
253 4,500,640
291 4,500,641

CLASS 440

27 4,500,297
62 4,500,298

CLASS 446

230 4,500,299

CLASS 455

78 4,501,017
83 4,501,018
112 4,501,019
226 4,501,020
601 4,501,021
4,501,022

CLASS 464

83 4,500,300

CLASS 474

28 4,500,301
82 4,500,302
112 4,500,303
138 4,500,304
201 4,500,305

CLASS 493

92 4,500,306
196 4,500,307

CLASS 501

54 4,500,642
96 4,500,643
98 4,500,644

CLASS 502

65 4,500,645
78 4,500,646
101 4,500,647
115 4,500,648
167 4,500,649
204 4,500,650
208 4,500,651

CLASS 514

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56 4,500,519
63 4,500,520
81 4,500,521
173 4,500,522
178 4,500,523
210 4,500,525
223 4,500,527
226 4,500,526
228 4,500,528
235 4,500,529
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301 4,500,534
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367 4,500,538
383 4,500,537
397 4,500,536
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452 4,500,731
465 4,500,542
466 4,500,541
469 4,500,543
474 Re.31,836
543 4,500,544
619 4,500,545
781 4,500,546

CLASS 521

33 4,500,652
90 4,500,653
129 4,500,654
163 4,500,655
164 4,500,656

CLASS 523

116 4,500,657
117 4,500,658
213 4,500,659
400 4,500,703
428 4,500,660

CLASS 524

77 4,500,661
99 4,500,662
101 4,500,663
119 4,500,664
227 4,500,665
232 4,500,666
406 4,500,667
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445 4,500,670
494 4,500,671
496 4,500,672
533 4,500,683
548 4,500,673
650 4,500,674
762 4,500,675

CLASS 525

54.2 4,500,676
57 4,500,677
64 4,500,679
143 4,500,680
222 4,500,681
240 4,500,682
327.3 4,500,684
343 4,500,685
408 4,500,686
412 4,500,687
431 4,500,688
442 4,500,689
502 4,500,690
503 4,500,691

CLASS 526

201 4,500,692
240 4,500,693
245 4,500,694
279 4,500,695

CLASS 528

45 4,500,696
4,500,697

	4,500,698
128	4,500,699
328	4,500,700
363	4,500,701
388	4,500,702
405	4,500,704
417	4,500,705
502	4,500,706
CLASS 534	
635	4,500,455
CLASS 536	
27	4,500,707
CLASS 544	
34	4,500,708
58.1	4,500,709
113	4,500,710
258	4,500,711
CLASS 546	
67	4,500,712
165	4,500,713
309	4,500,714
CLASS 548	
140	4,500,715
196	4,500,716
229	4,500,717
471	4,500,718
522	4,500,719
CLASS 549	
313	4,500,720
362	4,500,721
429	4,500,722
459	4,500,723
CLASS 556	
472	4,500,724
482	4,500,725
CLASS 560	
179	4,500,727
222	4,500,728
225	4,500,729
CLASS 562	
416	4,500,730
486	4,500,732
506	4,500,733
CLASS 564	
72	4,500,734
286	4,500,735
417	4,500,736
CLASS 568	
329	4,500,737
433	4,500,738
677	4,500,739
796	4,500,740
CLASS 604	
4	4,500,308
5	4,500,309
228	4,500,310
246	4,500,311
263	4,500,312
280	4,500,313
346	4,500,314
379	4,500,315
389	4,500,316

CLASSIFICATION OF DESIGNS

D2—	234	277,614
	274	277,615
	309	277,616
	354	277,617
D3—	54	277,620
	71	277,618
		277,619
D6—	311	277,631
	317	277,626
	334	277,621
	422	277,624
		277,625
	423	277,623
	500	277,629
	501	277,630
	514	277,628
	520	277,622
	574	277,627
D7—	76	277,632
		277,633
	386	277,634
D8—	18	277,635
	30	277,636
	47	277,637
	62	277,638
	72	277,639
	88	277,640
	101	277,641
	356	277,642
	373	277,643
	396	277,644
	402	277,645
D9—	352	277,646
	377	277,647
	445	277,648
D10—	32	277,649
	78	277,650
	82	277,651
	106	277,652
	123	277,653
D11—	2	277,654
	31	277,655
	81	277,656
D12—	5	277,657
	101	277,658
	110	277,659
	204	277,660
	211	277,661
D13—	5	277,662
D14—	58	277,663
	[illegible]	277,664
		277,665
	63	277,666
	68	277,667
	69	277,668
	84	277,669
	100	277,670
		277,671
		277,672
	106	277,673
	113	277,674
D15—	7	277,675
	13	277,676
	27	277,677
	123	277,678
	127	277,679
D18—	5	277,680
	7	277,681
D19—	47	277,682
D20—	17	277,683
D21—	59	277,684
		277,685
	108	277,686
	128	277,687
	133	277,688
	134	277,689
	135	277,690
	210	277,691
	219	277,692
	225	277,693
D22—	25	277,694
D23—	49	277,695
	69	277,696
	121	277,697
D24—	4	277,698
	29	277,699
	48	277,700
D26—	67	277,701
D27—	23	277,702
D30—	14	277,703
	15	277,704
	16	277,705
D32—	18	277,706
D34—	6	277,707
	20	277,708

CLASSIFICATION OF PLANTS

P.—	34	5,406

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PATENTS

01 :	4,500,700	4,500,104	4,500,879	4,500,967	4,500,067	19 :	4,500,923
04 :	4,499,688	4,500,113	4,500,890	10 : 4,499,716	4,500,068		4,499,624
	4,499,766	4,500,128	4,500,916	4,500,238	4,500,072		4,499,908
	4,499,767	4,500,129	4,500,933	4,500,344	4,500,083		4,499,914
	4,499,903	4,500,135	4,500,943	4,500,432	4,500,148		4,499,963
	4,499,984	4,500,137	4,500,952	4,500,520	4,500,210		4,500,062
	4,500,206	4,500,153	4,500,965	4,500,699	4,500,212		4,500,110
	4,500,273	4,500,163	4,500,993	4,500,705	4,500,237		4,500,250
	4,500,392	4,500,170	4,500,996	12 : 4,499,735	4,500,298		4,500,841
	4,500,816	4,500,172	4,500,997	4,499,762	4,500,312		4,500,852
	4,500,831	4,500,176	4,501,005	4,499,901	4,500,382		4,500,874
	4,500,954	4,500,177	4,501,007	4,499,968	4,500,439		4,500,986
	4,500,970	4,500,178	08 : 4,499,676	4,500,014	4,500,453	20 :	4,499,627
	4,500,994	4,500,200	4,499,687	4,500,015	4,500,475		4,500,034
05 :	4,499,886	4,500,201	4,499,770	4,500,026	4,500,488		4,500,042
06 :	4,499,613	4,500,294	4,499,771	4,500,085	4,500,543		4,500,242
	4,499,616	4,500,299	4,499,781	4,500,089	4,500,552		4,500,290
	4,499,629	4,500,307	4,499,933	4,500,098	4,500,576		4,500,309
	4,499,642	4,500,311	4,500,123	4,500,158	4,500,654		4,500,757
	4,499,658	4,500,345	4,500,229	4,500,295	4,500,667	21 :	4,499,946
	4,499,667	4,500,363	4,500,328	4,500,306	4,500,673	22 :	4,499,846
	4,499,691	4,500,386	4,500,436	4,500,403	4,500,701		4,500,059
	4,499,710	4,500,404	4,500,498	4,500,800	4,500,708		4,500,491
	4,499,721	4,500,407	4,500,707	4,500,827	4,500,726		4,500,717
	4,499,723	4,500,408	4,500,799	4,500,877	4,500,732	24 :	4,499,617
	4,499,733	4,500,409	09 : Re.31,835	4,500,881	4,500,740		4,499,653
	4,499,736	4,500,423	4,499,625	4,500,947	4,500,788		4,499,811
	4,499,768	4,500,424	4,499,755	4,501,017	4,500,850		4,499,830
	4,499,772	4,500,434	4,499,777	4,501,018	4,500,880		4,499,841
	4,499,800	4,500,484	4,499,832	13 : 4,499,664	4,500,908		4,500,064
	4,499,809	4,500,492	4,499,842	4,499,668	4,500,936		4,500,175
	4,499,818	4,500,494	4,499,860	4,499,713	4,500,938		4,500,243
	4,499,828	4,500,495	4,499,937	4,499,990	4,500,985		4,500,244
	4,499,833	4,500,500	4,500,028	4,500,039	4,501,002		4,500,265
	4,499,858	4,500,507	4,500,038	4,500,375	4,194,685		4,500,330
	4,499,885	4,500,515	4,500,087	4,500,481	18 : 4,499,669		4,500,380
	4,499,893	4,500,539	4,500,173	4,500,753	4,499,995		4,500,391
	4,499,894	4,500,555	4,500,197	4,500,862	4,500,046		4,500,530
	4,499,938	4,500,613	4,500,252	16 : 4,499,957	4,500,111		4,500,637
	4,499,945	4,500,621	4,500,268	4,500,001	4,500,132		4,500,703
	4,499,950	4,500,669	4,500,483	4,500,108	4,500,144		4,500,823
	4,499,955	4,500,737	4,500,535	4,500,231	4,500,154		4,500,842
	4,499,956	4,500,754	4,500,548	17 : 4,499,663	4,500,215		4,500,856
	4,499,970	4,500,758	4,500,580	4,499,705	4,500,230		4,500,984
	4,499,987	4,500,777	4,500,582	4,499,708	4,500,247		4,501,001
	4,500,016	4,500,786	4,500,605	4,499,734	4,500,303	25 :	Re.31,833
	4,500,031	4,500,814	4,500,658	4,499,786	4,500,343		4,499,615
	4,500,033	4,500,836	4,500,713	4,499,820	4,500,393		4,499,649
	4,500,045	4,500,840	4,500,780	4,499,887	4,500,456		4,499,656
	4,500,052	4,500,843	4,500,805	4,499,915	4,500,533		4,499,659
	4,500,056	4,500,846	4,500,870	4,499,978	4,500,545		4,499,679
	4,500,079	4,500,855	4,500,949	4,499,991	4,500,561		4,499,752
	4,500,093	4,500,858	4,500,966	4,500,021	4,500,595		4,499,756

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